THE

VETERINARY JOURNAL

MAY, 1908.

Editorials.

THE PRIVY COUNCIL AND THE PROPOSED NEW BILL.

WE feel sure that most of our readers will be glad to know of the action of the Privy Council in considering the proposed new Bill to which we have so often referred. There were four principal points which the Royal College of Veterinary Surgeons wished to establish by this Bill, namely, to bring "existing practitioners" under the control of the Royal College, and to afford them in return privileges enjoyed by Members of the Royal College of Veterinary Surgeons; to institute an annual registration fee of one guinea payable by Members of the Royal College of Veterinary Surgeons; to render it illegal for any unqualified person to act for fee or reward as a veterinary surgeon; and to render companies liable to the same penalties as individuals.

The Report of the Parliamentary Committee presented at the April meeting of the Council of the Royal College of Veterinary Surgeons showed that the Privy Council had favourably considered three of those principles, but were of the opinion that absolute prohibition of unqualified practice was impossible. On the other hand, however, their lordships agreed that it should be made illegal for unqualified persons to "imply" that they were veterinary surgeons. We regret that the Privy Council were unable to see "eye to eye" with us on that point, but at the same time this slight addition will strengthen considerably the hands of the Council of the Royal College of Veterinary Surgeons in their endeavour to diminish some of the evils of quackery.

The most important item, however, is that the Privy Council agreed that a fee should be required to be paid annually by Members of the Royal College of Veterinary Surgeons. They thought, and we heartily agree, that ample notice of non-payment should be given, and a sufficient time allowed to cover accidents, contingencies, and difficulties of a personal character, and provision should be made for the restoration of a name to the Register on reasonable terms. The Council of the Royal College of Veterinary Surgeons are obviously desirous of being anything but harsh, and have re-drafted the clause dealing with that point so as to give ample opportunity for payment of the fee, and obviating disastrous results by not doing so. The amended clause now reads: "If the annual registration fee of a member shall not have been paid on or before January 30 in any year, the Registrar shall send to such member by post at such address as aforesaid another notice requiring payment, and if such payment shall not be made within one month from posting such notice a final notice shall be sent to such member by registered post requiring such payment, and warning such member of the consequences of non-payment." Sub-clause 3 provides that any member "who shall not have paid such annual fee for the time being within one month from posting of the final notice mentioned in the last preceding subsection shall cease to be on the Register of Veterinary Surgeons, and shall be liable to the penalties and be under the disabilities declared in and by Section 4 of this Act." Adequate provision is also made for the restoration of names to the Register, on reasonable explanation being furnished and the payment of the fee, with a penalty not exceeding the amount of the fee. We are of opinion that the above emendations will appeal to all our readers, and will reconcile those who were of opinion that the enforcement of payment of a registration fee might create great hardship on some members.

As we said in a previous issue, no draft Bill ever produced was perfect, but it speaks well for the promoters of this Bill that the Privy Council have received it so favourably. We hope it will soon pass into law, and with very little further alteration. The lay opposition with reference to absolute prohibition of unqualified practice has been appeased, and almost all the Veterinary Associations have signified their approval. We believe one Veterinary

Society has, since the Council Meeting, endorsed the recent action of the Council and unanimously passed a vote of confidence. All reforms meet with some opposition, but we are sure the Council of the Royal College of Veterinary Surgeons will receive the sincerest thanks of veterinary surgeons for their earnest work on behalf of the profession as a whole.

THE PROFESSION IN CANADA.

NEWS of our professional brothers in other lands is always welcome, and we acknowledge with pleasure the receipt of a Toronto daily paper sent by a correspondent, because it contains a long article relating to the Ontario Veterinary College. The occasion was the inaugural ceremony of the Forty-seventh Annual Session, the chairman being the founder and present principal of the College, Mr. Andrew Smith, F.R.C.V.S., with whom were associated on the platform several men of high position in Canada. The Principal spoke of certain proposed changes in the conducting of the College; he trusted that the Provincial Department of Agriculture would take it over and carry it on as a component part of Toronto University. Then the College would be on a basis that would ensure its existence "for all time."

The Ontario Veterinary College was founded nearly half a century ago by a member of the Royal College of Veterinary Surgeons, and it owes its present important position mainly to his strenuous efforts. The number of students in the College during the session which ended last month was about 400, a number which compares very favourably with that of any College under the jurisdiction of the Royal College of Veterinary Surgeons. We read with satisfaction that the College course is to be increased from two years to three, and we hope that this lengthened course and the consequent increased expense of graduating will not cause a falling off in the numbers of the students.

Our best wishes are with the promoters of this flourishing College in their labours to place it on a thoroughly efficient basis.

General Articles.

THE VALUE AND USE OF MORPHIA IN CANINE SURGERY.

BY FREDK. HOBDAY, F.R.C.V.S., F.R.S.E., KENSINGTON, W. (LATE PROFESSOR OF THERAPEUTICS IN THE ROYAL VETERINARY COLLEGE, LONDON).

MORPHIA has been recognized for many years past as an agent which is useful to minimise pain in the human subject as well as in animal patients, but in the case of the latter it is universally conceded by all veterinary therapeutists who have studied its action that its effect on the different species of veterinary patient differs very considerably. For example, in the horse and cat one gets a totally different effect to that obtained in the dog, delirium being a prominent feature in the former species, whilst in the case of the dog narcosis is rapid and profound. Even in canine patients there are idiosyncrasies to be reckoned with, but, with a small percentage of exceptions, the statement that narcosis is rapidly produced is the one which most commonly proves to be true.

In surgical work this can be made use of both to assist in keeping the patient still, and thus aiding delicate manipulative skill and the diminution of pain. Minor operations can be performed by its aid alone, and quite severe operations, if able to be done speedily, can be done by the additional aid of some local anæsthetic, such as cocaine, novocain, eudrenine, or codrenine. To an operator, placed as most veterinary surgeons are, who has to work single-handed, or at most aided by a groom or other servant, the knowledge of its use is a boon; and half the anxiety which the operator suffers through dreading the use of chloroform or ether in the hands of an inexperienced anæsthetist becomes done away with. The use of morphia before handling a vicious dog makes the patient tractable and harmless, and for the setting of fractures in restless patients it is of use both at the time and afterwards; the work can be done so much more neatly when the patient is quite still than when it is wriggling about, and after the limb has been set the dog lies still for several hours, and thus allowing the plaster or gum to set firmly.

In cases involving laparotomy, combined with chloroform, there is less tendency to straining, and consequent ejection of the bowels through the wound, and for hernia operations its use is invaluable.

As a drug it is classed as a narcotic rather than a true anæsthetic, but its stupifying and soporific effects are so well marked in the dog that even if a short period of pain is produced the patient speedily relapses into a state of somnolence or narcosis again.

Its effect in this direction has been much more generally made use of by our Continental *confrères*, and it is with a view to bringing it more prominently in front of the profession in England that the undermentioned cases (as shown on pp. 222-227) are published.[1]

[1] A more detailed paper, based mainly on these observations, was read before the Central Veterinary Medical Society on May 6, 1908.

The average dose necessary to produce the desired effect is about $\frac{1}{16}$ of a grain per pound body weight, although this can be exceeded with perfect safety. In fact, the insusceptibility of the dog to large doses of morphia is perfectly extraordinary. So much so that it is quite impossible to state with certainty what reasonable dose will be lethal. One has only to yield to the importunate desire of a kind-hearted client to find this out, and the following cases are typically illustrative. That the process is painless is beyond question, and as a previous adjunct to the administration of chloroform or hydrocyanic acid it is of value, but the length of time taken and the uncertain sequel at the end of even a prolonged period, will always make its use for this purpose unreliable and unpopular. The following cases illustrate this in a marked degree :—

Breed and sex	Age	Weight	Reasons	Dose	Remarks
		lb.			
Fox-terrier ... (male)	4½ months	About 10	A very severe fracture of the leg	15 grs.	9 p.m., morphia administered in order to put painlessly away. 9.3 p.m., vomited. 10.45., lay like a log, but could readily be roused for a few moments. 12 midday, could walk and as it was palpable that the morphia would not have the desired effect the animal was chloroformed.
French poodle (male)	13 years	About 32	Cancer of the throat	18 grs.	This was given with the object of painlessly putting the animal away, but although the dog became completely narcotised, it had sufficiently recovered 36 hours later to be able to walk and feed, and the end was accomplished in the lethal chamber.
Pug (male) ...	7 months	8	Follicular mange	20 grs.	This large dose was administered in order to put the dog painlessly away, but as the animal was still alive 48 hours later, a dose of hydrocyanic acid was given.

It is, however, toxic, and dogs can be killed by its use, but the dose must always be large and individual susceptibility must always be taken into account. Professor Kaufmann, of Alfort, in his excellent standard work on "Therapeutics" (*Traité de Thérapeutique et de Matière Medical Vétérinaires*) places the toxic dose at 1 gramme (15·432 grains) for a large dog and 0·1 gramme (1½ grains) for a small one, but the terms "large" and "small" are so elastic that this hardly expresses matters as one would wish. A dosage reckoned per pound body weight would be much more satisfactory, if it were possible to calculate it.

The effects produced by a medicinal dose are that in about three minutes the patient will vomit and this will, in the majority of instances, be followed by defæcation. The knowledge of this action in

No.	Breed and sex	Age	Approximate Weight	Operation	Amount given	Remarks
			lb.		grains	
1	Bull-bitch ...	4 years	50	Venereal tumours	1	Operated thirty minutes later. The bitch distinctly felt pain just when the growths (which were extensive) were being excised, but speedily relapsed afterwards into a dreamy state. Cocaine solution was also used, but it is difficult in this class of case to enable any local anæsthetics to penetrate the deeper parts.
2	Bull-bitch ...	5 years	45	Venereal tumours	1	As with Case 1. This patient was of a very vicious temperament, and the dose of morphia might, with advantage, have been larger.
3	Bulldog (male) ...	3½ years	40	Venereal tumours	4	Prostrate, apparently comatose about ten minutes later, but was momentarily roused by the application of the scissors.
4	Great Dane (male)	10 months		Entropium of both eyelids of one eye	1	Operated twenty-three minutes later. In this case the value of the drug as a narcotic, and as an adjunct to the securing process for a large and powerful dog, was well illustrated. The animal "winced" just when the excision was made, but the pain expressed was very slight, and when the wounds were painted with cocaine and adrenalin solution the operation was completed painlessly.
5	Aberdeen (female)	9 months	16	Gersuny's wax operation for prolapsed rectum	1	Operated thirty-five minutes later. Narcosis was never completely attained, and the animal distinctly felt the insertion of the needle.
6	Bloodhound (male)	4 years		Entropium of four eyelids...	1½	Operated about forty-five minutes after the injection. This result was very satisfactory.
7	Irish terrier (male)	6 years	25	Entropium of two eyelids...	1	Result very satisfactory. The pain expressed was very slight. Operated about thirty-five minutes later. Used a solution of cocaine and adrenalin to paint the parts with.
8	Irish terrier (male)	6 years	18	To extract a diseased carnassial molar root for pus in the antrum.	1½	Operated about twenty minutes later. In this case the morphia helped very materially to keep the patient still, but the tooth was much firmer than was estimated, and the use of inhalations of chloroform was considered advisable to finish the operation.
9	Bull-bitch ...	3 years	48	Prolapsed vagina	2	Operated twenty-five minutes later. This result was quite satisfactory, a piece about the size of a filbert being removed by excision.
10	Borzoi (male) ...	7 years		To aid in painlessly destroying the animal	4	This answered satisfactorily, the dog lying literally "like a log" and completely narcotised forty minutes later, when hydrocyanic acid was administered. The hydrocyanic acid took rather longer to act than when given without any drug having been previously administered.

11	Bull-bitch ...	18 months	40	Prolapsed vagina	1	This was also painted with a solution of cocaine and adrenalin, and acted well. The operation was performed about twenty minutes after the injection.
12	Fox terrier (female)	2 years	13	Ovariotomy...	2	Operated twenty minutes later, the patient apparently showing no pain. The bitch lay very quiet for two hours after the operation.
13	Bull-bitch ...	2 years	40	Large venereal tumours ...	3	As in Case 1, but here the growths were very extensive and the pain was much more severe, and chloroform anæsthesia was resorted to. Twelve hours later the animal was quite conscious and moving about.
14	Fox terrier (male)	9 years	18	Castration for enlarged prostate	2	Operated about twenty-five minutes later, the operation being by the ligature method, and the result excellent; there was just a slight "flinch" when the cord was ligatured and excised, but otherwise no signs of pain, and the patient relapsed at once into a state of dreamy unconsciousness.
15	Dachsund (female)	8 months	6	Entropium of two eyelids...	1	Operated about one hour and thirty minutes later, the result being satisfactory as in Case 7.
16	Irish terrier (male)	9 years	30	Abscess of the face and curettage of the bone	1	Operated forty minutes later. Evidence of sensation was shown when the actual curettage was performed, but the patient soon became narcotised again.
17	Bulldog (male) ...	4 years	30	Operation to remove buried ligature from the spermatic cord	1½	This animal was very vicious; the operation was done forty minutes later, but narcosis was incomplete, and chloroform anæsthesia was resorted to to complete the operation.
18	Laverack setter (female)	7 years	66	Dissection of subcutaneous cyst from the dorsal region	1	Operated about thirty-five minutes later, the result being excellent.
19	Irish terrier (female)	6 years	30	Extraction of loose teeth ...	1	The operation was performed about fifty minutes later, the advantage of the drug as an adjunct for keeping the patient still being well demonstrated. As the teeth were loose or diseased ones, the amount of pain expressed was practically "*nil*."
20	Bull-bitch ...	—	45	Venereal tumours	1	As with Case 1.
21	Bull-bitch ...	—	45	Venereal tumours	1	As with Case 1.
22	Airedale (male) ...	18 months	25	Entropium of four eyelids...	1	As with Case 7, and the result very satisfactory.
23	Collie (female) ...		70	Removal of mammary tumours	1½	Operated about forty-five minutes later, the result being excellent for all the superficial excisions, but momentary pain was expressed when the deeper structures were cut through, and a solution of cocaine and adrenalin was used.
24	Bloodhound(male)	2 years	—	Entropium of both eyelids	2	As with Case 4. Operated one and a quarter hours afterwards. In this case pain was distinctly felt when the excision was made, although the animal did not struggle much and was quite manageable. Cocaine and adrenalin solution was used.

No.	Breed and sex	Age	Approximate weight	Operation	Amount given	Remarks
			lb.		grains	
25	Bulldog (male) ...	—	—	Entropium	1½	As with Case 4. 2.30 gave 1 grain. Vomited three minutes later. 3.20 not narcotized, so gave ½ grain more. Result satisfactory.
26	Great Dane (male)	6 years	110	Amputation of tail... ...	2	Operated one and a quarter hours afterwards, injecting codrenine subcutaneously. The result was apparently quite painless.
27	Bloodhound(male)	4 years	75	Entropium	3	As with Case 4. Operated forty minutes later.
28	Pug (male) ...	5 years	8	Curetting for abscess in ear	1½	Operated about twenty-five minutes later. The pain was undoubtedly less than it would have been without the morphia, but when the deeper structures were curetted the patient felt pain, although speedily relapsing into a state of stupor again.
29	Bull-bitch ...		40	Vaginal tumours	1½	As with Case 1.
30	Bull dog (male) ...		40	Entropium of two eyelids ...	1½	As with Case 4.
31	Fox hound, puppy (male)	7 weeks	16	Umbilical hernia	1	Operated an hour later. The skin was painted with codrenine solution.
32	Dandie (male) ...	aged	18	Entropium of two eyelids ...	1	As with Case 4.
33	Irish terrier (male)	2 years	20	Entropium	1	As with Case 4.
34	Gt. Dane (male)	4 years		Entropium	3	As with Case 4.
35	Pomeranian (male)	3 years	8	Removal of warts	1	Operated about fifteen minutes later, the result being quite satisfactory.
36	Mount St. Bernard (female) ...	8 years	100	Leg amputation (osteo-sarcoma)	3	Operated one and a half hours later. The morphia in this case was a useful adjunct to the manipulation and fixing of the patient into a proper position for operating; but chloroform anæsthesia was applied for the operation.
37	Bloodhound(male)	—	about 60	Removal of membrana nictitans	2	Operated an hour later. The result was very satisfactory in that the patient was perfectly quiet. Cocaine solution was used locally.
38	Collie (male) ...	5 years	50	Lancing and curetting an old wound on face	2	This operation was performed forty-five minutes afterwards, and was quite satisfactory.
39	Irish terrier (male)	7 years	28	To set fractured leg ...	1	The treatment was applied twenty minutes after the administration. In this case the morphia proved of excellent service, as the patient, a most restless and troublesome dog in the ordinary way, was quite readily amenable to treatment, and lay quiet for some hours afterwards, thus allowing the plaster of Paris bandage to become properly set and hard.
40	Irish terrier (male)	6 years	25	Fractured pelvis	1	As with Case 39, and especially useful, as the dog had a very nasty temper.

41	Griffon (female)...	—	5	Removal of mammary tumour	½	Codrenine applied locally. Quite satisfactory.
42	Bulldog (male) ...	10 months	40	Operating on toe	2	In this case the operation consisted in excising a portion of one of the toes, and cocaine was injected, the result being quite satisfactory.
43	Griffon (female) ...	10 years	4	To remove 6 loose teeth ...	½	Operated one hour later ; quite satisfactory.
44	White-haired terrier (male) ...	14 years	12	Anal adenomas	2	With the local aid of solution of novocain this proved very satisfactory.
45	Bulldog (female)...	3½ years	30	Venereal tumours	2	As in Case 1.
46	Bulldog (female)...	4 years	25	Venereal tumours	2	As in Case 1.
47	Cocker spaniel, puppy (male)	6 months	8	Pterygium	1	Operated thirty minutes later with the aid of cocaine solution. Quite satisfactory, the patient lying perfectly still.
48	Bulldog (female)...	2 years	18	External squint	1	In this case morphia proved a most valuable aid for keeping the puppy still, as in the ordinary way she was a most restless animal. A solution of cocaine and suprarenin was used locally as well.
49	Dachsund (male)	7 years	14	Castration	2	The operation was performed an hour later, and the result was excellent, the only sign of sensation being shown momentarily when the ligatures were applied.
50	Cocker spaniel, (male)	6 months	8	Pterygium	1	As in Case 48.
51	Pomeranian (male)	7 months	4½	Colic	½	Sleeping quietly half an hour later. Eight hours later another ½ grain was given, as the pain was returning, and answered satisfactorily. The patient recovered.
52	Griffon (male) ...	2 years	4	Removal of warts from the mouth	½	Operated forty-five minutes later. The morphia aided in keeping him still, but did not act as an anæsthetic, and eudrenine was painted over the part before further warts were removed.
53	White Pomeranian (male)	7 months	5	For removal of injured dew-claw	½	Painted with cocaine and suprarenin. The result was satisfactory.
54	Bulldog (male) ...	8 months	45	Amputation of end of fractured and deformed toe and whole of nail	2	Injected with cocaine, the result being satisfactory. Operated forty minutes later.
55	Collie (male) ...	4 years	32	To curette sinus of masseter muscles	1	Operated an hour later. The patient was very easily restrained, but distinctly felt some pain when the depths of the sinus were curetted.
56	Mount St. Bernard (female)	8 years	100	Given to induce sleep and ease the pain	2	The result was not satisfactory, as the patient passed a very restless night.
57	Mount St. Bernard (female)	8 years	100	As aid to putting away with chloroform	2	This patient was the same as Case 63, but this time (the next day) the result was in every way satisfactory.
58	Great Dane ... (female)			Removal of tumour ...	2	Cocaine was injected locally and the result was satisfactory, the value of the morphia as an adjunct to securing the patient being well demonstrated.

No.	Breed and sex	Age	Approximate weight	Operation	Amount given	Remarks
			lb.		grains	
59	Great Dane ... (female)	9 years	100	Vaginal fibromata	5	Injected with cocaine and suprarenin, the result being satisfactory.
60	Irish terrier ... (female)	7 years	16	Extraction of molar tooth root	1½	Result not satisfactory. Chloroform was administered to complete the operation.
61	Borzoi (female) ...	15 months	—	Ovariotomy	3	Chloroform was administered as well, and the result was satisfactory. After recovering from the anæsthetic she appeared delirious and very excited, this stage lasting for fully three hour, when it gradually passed off and did not reappear.
62	Fox-terrier (male)	7 years	20	Cataract	2	Cocaine applied locally, the animal remaining very still, and the result quite satisfactory.
63	Gordon Setter ... (male)	2 years	50	Removal of cyst on back ...	1	Result satisfactory.
64	Great Dane (male)	10 years	About 100	Tumour of bowel	2	Cocaine was injected locally, the morphia being a useful aid in securing the patient.
65	Bulldog (male) ...	18 months	About 40	Amputation of prolapsed rectum	1	The operation was commenced with the use of the morphia alone, but was completed with the aid of cocaine solution.
66	Fox-terrier ... (female)	1½ years	15	A large inguinal hernia ...	1	The skin was painted with cocaine, the relaxation of the muscles caused by the morphia being of the greatest value and assistance in the performance of the operation.
67	Irish terrier (male)	4 years	30	Lacerated ear, dress and suture	1	In this case the morphia proved of the greatest value, and the animal seemed to feel nothing whatever of the operation.
68	Bulldog (female)	2 years	About 40	Operation on ear tumours	1	Cocaine solution was also applied, but the result was not satisfactory.
69	Aberdeen terrier (male)	6 months	8	For laparotomy and reduction of intussusception	½	This patient was in too weak a state for chloroform, and showed no evidence of pain during the operation.
70	Bulldog (female)	2 years	40	Ear tumours	1	This was the same case as No. 68, but in this instance chloroform was also administered, the result being satisfactory.
71	Pekingese (female)	2 years	8	Removal of injured eye ...	½	Cocaine and suprarenin used as well, only very slight pain being evinced.
72	Mount St. Bernard (male)	6 months	50	Removal of injured dew-claw	1	Result satisfactory.
73	Pug (male)	6 months	5	Laparotomy and reducing intussuscepted and prolapsed bowel	½	Operated twenty minutes later. Very slight evidence of pain just when skin excised; no pain when manipulating the bowel.

74	Schipperke (male)	10 months	6	Castration	1 Quite satisfactory. Operated thirty minutes later.
75	Great Dane ... (female)	1½ years	80	Entropium	3 Operated one hour later. Painted with suprarenin and cocaine. Result satisfactory.
76	Airedale (male) ...	Aged	50	Nasal examination and curettage	1 In this case the morphia was not of much value.
77	Foxhound (male)	6 months		Umbilical hernia... ...	1 Painted the skin with novocain. The result was in every way satisfactory.
78	Mount St. Bernard (male)	3 years	112	For hæmatoma of earflap	5 In this case the morphia acted as an excitant, and was not satisfactory.
79	Great Dane (male)	1½ years	111	Removal of cartilago nictitans and operating on the teeth	5 Very satisfactory, as the animal was a very vicious one when in health.
80	Fox-terrier (male)	12 years	18	Amputation of hind leg ...	1 Chloroform was also administered, the result being very satisfactory, the morphia distinctly easing the pain of a badly crushed limb.
81	Bulldog (male) ...	18 months	50	Prolapsed anus	2 The morphia was undoubtedly a great help in the reduction of the prolapsed bowel.
82	Bulldog (female)	6 months		Prolapsed vagina	2 Acted satisfactorily, the prolapsed part being ligatured, apparently painlessly.
83	Bulldog (male) ...	18 months	50	Proctopexia and reduction of intussusception	5 Very satisfactory, a small quantity of codrenine solution being used subcutaneously for the skin.
84	Great Dane (male)	9 months	About 95	Removal of very large elbow tumour	2 Operated two hours later, the result being in every way satisfactory, the dog not even needing to be secured.
85	Fox-terrier (male)	12 months	14	Laparotomy	1 Operated forty-five minutes later, the stomach and intestines being examined for a foreign body, and the result in every way satisfactory.
86	Irish setter (female)	6 months	About 40	Ovariotomy	1½ Operated one and a half hours later, injecting codrenine subcutaneously. She lay perfectly quiet, and only winced slightly just when the uterine cornua were ligatured.
87	Retriever ...	5 years	—	To examine the head and ears	1 This animal was very vicious and unapproachable, and the morphia enabled the examination to be made with facility.
88	Bulldog	8 months	40	Cryptorchid	1 Chloroform was also administered for a portion of the operation, but only a very small amount was necessary, and the narcotising effect of the morphia in preventing straining was effectually demonstrated.
89	Irish terrier ...	2 years	—	Fracture	1 Result very satisfactory.
90	Poodle	5 years	50	Amputation of crushed toe	1 This animal was notoriously vicious, and the use of the morphia was of great value to secure and keep him quiet. Suprarenin and cocaine were used for the operation.

the dog makes it a useful drug to administer in urgent cases of strychnine poisoning, where the drug has not yet been absorbed from the stomach, and the narcosis, which speedily follows, makes it doubly useful in cases where the patient is in violent pain. In about four or five minutes the dog settles down into a state of somnolency, and in a quarter of an hour this is well marked. In a rare proportion of cases excitement and delirium, accompanied by hurried respiration, are produced.

After about half an hour this state of stupor is so well marked that manipulation of any part may be proceeded with, and in this stage a fractured leg or any such injury may be attended to. For operative procedure involving the use of the knife another quarter of an hour is advisable, and the state of narcosis is then about at its height. Even in this stage the clanging of metal or some such sound will rouse the patient for an instant, but it is only for an instant, and he speedily relapses into a dreamy state again.

Very large doses will cause refusal of food and staggering gait even for twenty-four or thirty-six hours, but with the average dose administered for surgical purposes the patient recovers sufficiently to walk about and take food in about twelve hours or so.

There is no appearance of pain, nor yet of nausea, on recovery, the most noticeable features being a staring eye and an unsteady gait.

Conclusions.

Briefly summed up the advantages are: —

(1) The safety of the drug when used with reasonable care.

(2) That the patient is less nervous and much more tractable and easy to manipulate.

(3) That the operator requires less help, and that a local or even a general anæsthesia can be applied or given with greater facility.

(4) That the patient does not struggle so much, and is less likely to become hurt during the operation or the process of securing.

(5) That the patient rests more tranquilly after the operation, and remains quiet for a considerable time.

Of the disadvantages, the first is that the patient usually vomits and passes fæces, two things to bear in mind when operating in a carpeted room.

Secondly, one must be prepared for idiosyncrasies, especially the delirium and hurried respiration above mentioned. It is not of comparatively frequent occurrence, but it occurred twice amongst the 90 patients mentioned here. It is rather an annoying thing to occur if the owner is standing by expecting to see the dog pass quietly off to sleep, and it appears to be as liable to follow a large dose as a moderate one. It appears to be due to idiosyncrasy of the individual.

The third disadvantage is the tendency to hæmorrhage, and this must be guarded against by the usual precautions taken when such is feared.

Fourth, a comparatively minor one, the patient may require (if belonging to a nervous owner) to stay in hospital for a few hours until sufficiently recovered to recognize its mistress.

THROMBOSIS OF THE ILIAC ARTERIES IN THE HORSE.

BY PROFESSOR G. UDRISKI, BUCHAREST.

THROMBOSIS of the iliac arteries is, although rare, an exceedingly grave condition of things, and in the earlier stages its diagnosis is extremely difficult. The author had the good fortune to come across a case that he was able to observe from the commencement, and to observe minutely.

The horse was a bay American, aged 9, the property of Her Royal Highness the Princess of Roumania. In the month of November the author was called in to examine him for a sudden lameness that he diagnosed as cramp of the off stifle joint. He prescribed a stimulating liniment with rest, and in three days the horse was going sound. About a month later he was again called in. Up to this date the horse had done his work, although he had been noticed to tire early. On the morning in question he had been ridden, but after a few minutes seemed to have a difficulty in moving his hind quarters, although not, strictly speaking, lame. This difficulty in moving increased with exercise. The general condition was normal; temperature 37° C.; the pulse 26 to 30, full and strong; respiration, 5 to 6 per minute. The mucous membranes were somewhat yellow, there was slight dulness in the front part of the chest, but nothing abnormal could be detected on auscultation. On examination *per rectum* the aortic pulse was normal, but the tension in the right iliac artery seemed to be lower than in the left; the urine was normal. On examining the leg the tension in the metarcarpal arteries was noticed to be less than in the opposite one, although there was no loss of power or feeling, neither were there any anæsthetic zones, although they were carefully looked for. The patellar reflex was weak, the degree of tension of the muscle increased, and the pupil slightly dilated. The fæces were hard and the pellets small; the ears were carried in a normal position. On the next day the temperature was 38° C., the pulse 30 per minute, and the respiration 6. The other symptoms were the same.

The third day the temperature was 38° C., pulse 35, and respiration 6 per minute; the pulse at the jaw did not, however, coincide with the heart beats, and there was a distinct jugular pulse. When mounted the horse would crouch under the weight of the rider. After four minutes exercise at a trot he began to get stiff on the off hind leg when it was abducted and the hocks were no longer flexed, and after five minutes the same was seen in the near one. The movements were quite incoördinate, the body being deviated from the straight line. Movement was made to the left; after seven minutes he could only stand with difficulty; the respirations were very quick, the nostrils dilated, and sweating over the hind quarters. After trotting for eight minutes the horse went down on the ground. The respirations were 46, pulse 54, and temperature 38° C. There was profuse perspiration from the external angle of the ilium to the thigh, the respirations were abdominal, the eyes staring and starting out of their sockets, the nostrils dilated, the back arched, and the flanks tucked up. There were violent spasms of the sterno-abdominal muscles and the limbs, and a great amount of flatus was passed. He kept opening and

shutting the mouth, and putting the tongue in and out; the mucous membrane became cyanosed and the body bathed in perspiration. The muscular spasms were so violent that it was feared a fracture would take place.

After a short time the horse turned over on his side and assumed the position of a dog with his fore legs stretched out in front of him. After remaining in this attitude for a short time he got on his knees, rested his head on the ground and raised up his hind quarters. These abnormal positions were only maintained a short time, and after about twenty minutes he was able to get up on his feet. In an hour from the commencement of the attack he was in his usual condition. This train of symptoms was repeated with the greatest regularity every time the horse was exercised at a trot, and on every occasion he went down exactly at the eighth minute, and this would be repeated several times a day.

In view of these symptoms, it was evident that there was some derangement in the arterial circulation of the hind limbs, in all probability thrombosis of the iliac arteries. The animal was ordered complete rest and 10 grammes of iodide of potassium daily, which was continued for fifteen days without any good result. With the sanction of the owner, he was destroyed.

On *post mortem* examination, the most important lesions discovered were hypertrophy of the heart, with slight pulmonary emphysema, and thrombosis of the abdominal aortic and iliac arteries, more especially the right one.

Professor Hendricks published an exceedingly interesting case of thrombosis of the aorta and iliac arteries in the horse in *Les annales de Médecine Vétérinaires*. The patient was an imported American gelding aged 7. For a year he had worked in harness, till he one day suddenly appeared to have a difficulty in moving his hind limbs, the off being worse than the near. A veterinary surgeon was called in, and, in the absence of other symptoms, diagnosed it as rheumatism, but the usual treatment was useless. The difficulty in moving became more and more pronounced, and long exercise seemed to have more effect on it than rest. In Professor Hendricks' case there was nothing to attract attention in the stable or when moved at a walk, but when trotted for ten minutes the difficulty in moving was so great that the horse lay down and was unable to get up.

The idea of a thrombus immediately struck Professor Hendricks, who obtained permission to bring the animal to the Brussels School for the benefit of the students. On examining him, he found that there were no points in which sensation was absent in the hind limbs, and that he could feel pin-pricks everywhere.

When exercised at a walk he went all right for about seven minutes, when the stiffness and difficulty in moving the hind limbs appeared, which developed into lameness on the off one. At first there was nothing special, but very soon he appeared incapable of flexing the hocks, the limbs became rigid, and the toe dragged along the ground. When stopped, spasms were seen in the muscles of the thigh. At a trot the same was seen on the left side; the stiffness became so great that the animal not only could not move, but could not even stand, and went down in spite of all efforts to prevent him. The back was arched, the abdomen tucked up, respirations quickened,

nostrils distended, the eyes staring, and the anxious look about the face showed the pain the animal was in.

The fore part of the body was bathed in perspiration, but it stopped sharply at the flank. This was particularly noticeable as, the season being the winter, the fore part of the body was enveloped in steam, while the hind quarters were dry. When the hand was applied to the fore quarter it felt warm, whereas the hind one was cold. The horse would remain down for about ten minutes, when he would get up; there was trembling of the hind quarters and difficulty in standing, which lasted from twenty to thirty minutes, after which the patient regained his usual condition. These phenomena were repeated many times, and always showed themselves with mathematical precision, and undoubtedly showed that there was an obstruction to the circulation in the hind quarters, and that although the blood supply was sufficient while at rest, it was not enough when worked. As both hind legs were affected equally, it was reasonable to suppose that the obstruction would be somewhere near the terminal portion of the aorta, and that it would be detected on examination; but this was not the case, and nothing abnormal could be detected.

Cases are reported by H. S. Elphick, of Newcastle-on-Tyne, in the VETERINARY JOURNAL of May, 1905; Professor Poenaru, of Bucharest ("Thrombosis of the Internal and External Iliacs") in *Le Progrès Vétérinaire* of January, 1898; Professor Gratia, "Un cas de thrombose simultanée de l'aorte postérieure de l'artère grande mésentérique et de la veine porte chez le cheval" (*Annales de MédecineVétérinaire, Bruxelles*, September and October, 1906); and Reynal, in 1888, in *L'Académie de Médecine de Paris*.

M. Goubaux has made a special study of eleven cases of thrombosis of the posterior aorta, and on two occasions he has found it associated with arterial lesions. In one case he found thrombosis in both the aorta and portal vein in a horse aged 9, which not only showed symptoms in the hind limbs, but bowel trouble and jaundice. In another he found old-standing thrombosis of both the splenic and portal veins.

M. Colin made some important observations on the results of obliteration of the portal vein in animals as regards the digestive organs, the abdominal circulation, and the secretion of bile.

Lesions of the arteries are well known in the horse, which explains the gravity of thrombosis in this animal, and this is proved by Professor Gratia's observations, which show that arterial clots are usually of older standing than venous ones.

In addition to thrombosis of the ileo-cæcal arteries caused by the larvæ of the sclerostoma and insufficiency of *vis a tergo* must be considered the presence of tubercles in the coats of the hepatic and splenic veins, also of cardiac insufficiency from dilatation.

Another point to be considered is the formation of fibrin in aneurisms in the mesentery, and the action exercised on stagnant blood in the vena porta, and what becomes of the coagulum. It can be disposed of in several ways: (1) by reabsorption, (2) by organisation, (3) by softening; and according to which process it undergoes, we find (*a*) the formation of a collateral circulation sufficient to compensate for the obstruction of the normal, (*b*) complete obstruction to the circulation in the hind limbs, (*c*) the condition of things remaining stationary.

Of course, reabsorption of the clot, with re-establishment of the circulation, is the most favourable solution, but, unfortunately, it does not often take place, and even if it does, the primary exciting cause remains, for the trouble is seldom due to alteration in the blood, but in the vessels, and especially from endoarteritis.

This point has been discussed by Hayern, Weigert, and Fridericof, who have thrown much light on the point. Micro-organisms and irritating toxins are capable of destroying the endothelial cells, and indirectly become factors in causing coagulation in vessels that are affected with endothelial alterations, and it is well known that arteries are only repaired with difficulty, if at all. It therefore will be seen that even if the clot should be reabsorbed, there still remain all the conditions favourable for the formation of a fresh one. In the second case, if the clot is organised, two results may take place: (1) if a collateral circulation is not re-established, gangrene from anæmia may take place, or (2) if it is re-established it may be sufficient to allow entire or partial function of the hind limbs.

When the manner in which an intra-vascular clot is organised is considered, the gravity, from a functional point of view, will be at once realised. From recent observations it would appear that it is not the coagulum itself, properly speaking, that becomes organised, as it undergoes granulo-fatty degeneration, and is replaced in the vessel by a mass of newly-formed connective tissue, which becomes a point of departure for the active endothelial cells. These cells become inflamed, swell up, and shortly form a layer of embryonic elements, in which process the inner and middle coats of the artery take part. The capillaries anastomose, and this fibro-vascular formation invades the whole clot, and the more intimately the clot and endothelium are in contact, the more thoroughly it takes place. Later on the coagulum disappears, its place being taken by newly-formed connective tissue. The same process takes place even if the endothelium is destroyed, the other coats of the artery fulfilling its functions. The organisation of the clot is not in favour of resolution, as its place is taken by new-formed connective tissue, which, if the cell proliferation is sufficently active, entirely obliterates the artery, but this is not often the case. The union between the clot and arterial coat is seldom complete, and a channel remains that allows of the passage of a certain amount of blood.

The establishment of a collateral circulation that will allow the passage of sufficient blood to completely supply the hind quarters is a termination that seldom or ever takes place, as can readily be realised if the size of the obliterated arteries and the large quantity of blood that passes through them is considered.

The only possible channels through which supplementary circulation can take place are: (1) By the anterior abdominal artery and the lower branches of the intercostals, which anastomose with the branches of the posterior abdominal artery, depending on the prepubian artery, which is a branch of the femoral. (2) By the large posterior artery of the thigh, which communicates with the obturator, one of the terminal branches of the internal iliac. (3) By the middle spinal artery, which communicates posteriorly with the ascending branches of the subsacral.

The author then discusses the question of the softening of the coagulum, which can cake place in the centre without undergoing any septic changes: The softening may take place throughout the entire

mass, or it may become arrested at a certain point, leaving a canal through the centre. The danger consists in the separation of small pieces from the clot, which may give rise to embolism, even at remote parts. When softening takes place, however, sepsis is not very common, but if it does occur, the origin of the infection is from outside. In the meanwhile the animal, to all outward appearances, remains healthy.

In the case in question the animal became incurable and was destroyed, so an opportunity of making a *post-mortem* examination occurred. The aorta contained a large organised hardened clot of an orange colour that adhered to the artery. It formed a plug with the blunt point turned forwards. The clot was granular and closely adherent to the artery, which was also roughened and deprived of the endothelial layer. The clot was continued backwards into both the internal and external iliacs, which were changed into solid cords, through which there was no circulation possible.

H. Bouley first pointed out that thrombosis of the iliac arteries would cause intermittent lameness behind, and later on Dr. Chariot, guided by Bouley's discoveries, observed the same in the human being. There are various theories regarding what causes the blood to coagulate.

Denis, of Commercy, has by a special process extracted a substance from the serum that he has termed "plasmine." It is not stable, and becomes resolved into two parts, concrete and fluid fibrin.

Schmidt, of Dorpat, also isolated two substances, fibrinogen and fibrino-plastic, which, when brought in contact, coagulated fibrin.

Hayem and Bizzozero attribute coagulation of the blood to alteration in the hæmoblasts, or Bizzoziro's plaques; salts of lime are also attributed with the same powers.

Cruveithier thought that intervenous coagulation was due to inflammation of the coats of the vessel, but Virchow, on the contrary, opposed this theory. His theory is that thrombosis was caused by cessation or diminution in the peripheric circulation, the heart power having decreased and the blood become stagnant. Zahn has shown that when the endothelium has altered thrombosis generally takes place in the vessel.

Glénard, following out some experiments of Brocke's, has placed a double antiseptic ligature on a vessel, and proved that although the blood was stagnant it did not coagulate. These experiments show that coagulation commences from the wall of the vessel, and that the fact of the blood being stagnant has nothing in the world to do with it.

(*Archiva Vétérinaria.*)

YOHIMBINE-SPIEGEL.[1]

REGARDING his trials with yohimbine-spiegel, one of our readers in Hungary reports to us as follows:—

"I have four Bernese cows, which are very fine, but unfortunately I have not been able to use them for breeding purposes, as they would not take up all the time. Following the advice of an agri-

[1] From the *Illustrated Kennel Gazette* (Vienna).

cultural paper, I had, with the assistance of the veterinary surgeon, three daily subcutaneous injections made of 0·05 gramme each. One hour before the act the cows received into their genitals an enema of a lukewarm 5 per cent. solution of bicarbonate of soda. The success was simply astonishing: three beautiful calves, and the fourth cow will have hers within a very short time." The same reader reports:—

"A pointer bitch came into heat regularly every year at the proper time. When I imported her I was told that she had thrown already once, but neither myself, nor the veterinary examination, nor the pedigree of the latest breed would confirm this report. For three years she was covered twice each year by one dog and three times by another, both being thoroughbred dogs of the same breed. The last connection was a *mésalliance*, for the dog which covered her was a regular shaggy bastard. I did not then, of course, care any more for her last breed. The preparation which I had used on my cows had attracted my attention. About four weeks ago, before she came into heat, I had the bitch treated with yohimbine-spiegel, giving her a dose of 0·025 gramme internally three times a day. After four days she came into heat and began to discharge, this lasting for thirteen days, whilst formerly the discharge had scarcely ever lasted three days. On the last day we administered an enema of a lukewarm 2 per cent. solution of bicarbonate of soda in the genitals, and then brought her to the dog. Covered there once every thirty-six hours, she bore on the fifty-sixth day—that is, eight days early—in August four healthy pups, which are all very healthy now, and which seem to thrive very well. The bitch is now 5 years old.

"It is, therefore, very advisable to use yohimbine-spiegel in exceptional cases, but not in order to cause a bitch to bear oftener than usual. The administrations of enemas of a solution of 2 per cent. bicarbonate of soda are always to be made, as they neutralize the acids which are always to be found during the time of heat. They always prove a *vade mecum* against the words, 'Not taken up, or not in use.'

"The quantities to be given to horses and cattle are 0·05 gramme; for sheep, goats and pigs, 0·01 gramme; for dogs under 10 kilos, 0·00025 gramme; up to 25 kilos, 0·001 gramme; over 25 kilos, 0·025 gramme, subcutaneously or internally, three times a day."

ON THE LIFE-HISTORY OF THE STABLE-FLY (*STOMOXYS CALCITRANS*, LINN.).

IN a recent issue of the *Journal of Economic Biology*,[1] Mr. R. Newstead, of the Liverpool School of Tropical Medicine, has given a full and detailed account of this blood-sucking fly, together with a series of drawings illustrating the eggs, larval details, and puparium. The subjoined notes and abstracts give the main points, as set forth by the author:—

"Farmyards and stables are evidently the favourite haunts of this fly; it occurs also in the fields, parks and open woods, especially where cattle are grazing, but is much less numerous in such places. It is

[1] Vol. i., part 4, pp. 157-166; pl. 12, figs. 1-8 (1906).

evidently also by no means uncommon in some of our large towns. . . . . It is fond of resting on surfaces fully exposed to the sun, such as doors, gates and rails, and, to a less extent, also on stone and brick walls. They are very active, but their flight is quite inaudible at a short distance, the noise produced being very feeble. When disturbed they frequently return to the same spot, but more especially so in favourite resting-places. At night they retire to some sheltered spot, and numbers may be found at rest on the beams and rafters in open sheds in farmyards, where they remain, almost inert, till the morning sun tempts them out again. They will also occasionally enter stables in the daytime, and they were seen to enter such places through a narrow opening or crack in the door.

"When at rest the front part of the body is often slightly raised, but not invariably so; and the wings, which touch at their bases, are widely divergent and carried in a horizontal position, lying practically in the same plane as the abdomen."

During the heat of the day the ratio of the sexes was about three males to one female, but towards evening the sexes occurred in about equal numbers. The flies are most abundant during August and the early part of September, but they also occur in smaller numbers throughout the month of October, especially on warm, sunny days, and an odd specimen was seen during the first week in November.

The author has proved that the blood-sucking habits of this fly is not a peculiarity of the female alone, as a freshly emerged male readily sucked blood from his own hand. In captivity the flies also fed upon the fresh fæces of the horse and sheep, and one was seen to suck up the juices from a dead companion. "Three specimens fed upon some sugar and water, and some also sucked up the moisture from a decayed and fœtid potato." When in the act of sucking blood "the whole of the proboscis was straightened and held vertically, and the anterior third was driven into the flesh. During the process, which lasted altogether for a period of fifteen minutes, the proboscis was constantly, but somewhat slowly, moved up and down, and also with an occasional semi-rotary movement, reminding one somewhat of the action of a quarryman's hand drill. This action was continued until the fly had pumped its body full of blood. The initial pain was trifling compared with that of a mosquito, but there were two subsequent pricks which were quite as irritating as the first. A small drop of blood was left over the puncture, and when this was washed away a small roseola was revealed, but there was no subsequent irritation or soreness of any kind. A clear fluid was passed from the anus four times during the process, and on several occasions subsequently, and judging from the size of the abdomen the food was rapidly assimilated. This fly died twelve hours after feeding."

In the process of egg-laying the ovipositor is fully extended and the eggs are passed down at intervals of from five to thirty seconds, and in captivity are usually laid in an irregular heap. In some instances the female was seen to separate the eggs by carefully passing her proboscis between them, and then drag them away and scatter them with her legs. Counts were made of seven batches, the maximum being seventy-one, the minimum forty-eight.

"The egg is white at first, but soon changes to creamy-white . . . . Form very elongate, shaped somewhat like a banana,

being curved on one side and almost straight on the other, the straight side with a broad, deep groove, which widens at the anterior end, giving it a spatuloid form. Surface with faint polygonal reticulations. The larva effects its escape by splitting the broad end of the groove, leaving it slightly raised and apparently intact on the opposite side." Incubation period two to three days. Length, 1 mm.

The larva is "creamy-white to pale ochreous, translucent, shining and almost glass-like; subcutaneous mouthparts black; the convoluted alimentary tract when filled with food gives the posterior half a blackish or greenish-black colour; tracheal tubes forming two submedian white lines and delicate lateral branches; posterior stigmata black; thoracic stigmata ochreous. Form long, tapering to a point in front, widely rounded posteriorly. Segmentation not very pronounced." It is therefore of the ordinary muscid type and somewhat resembles the larva of the common house-fly (*Musca domestica*).

In captivity the larval stage lasted from fourteen to twenty-one days, but the absence of excessive moisture and the admission of a little light materially retarded their development, which then extended over a period of from thirty-one to seventy-eight days, and some did not pupate before the winter set in. Larva reared under these conditions produced flies much below the average size.

The pupa or puparium is of the ordinary barrel-shaped type and of a bright terra-cotta red, changing to a dark chestnut brown before the emergence of the fly. This stage lasted from nine to thirteen days. Length 5 to 5·50 mm.

On emerging from the puparium the fly is dark grey in colour, the head wider than the thorax, and the abdomen much attenuated. Its subsequent development is extremely interesting, and there are three well marked stages.

(1) An active stage, which lasts for about half an hour, in which the insect devotes nearly the whole of its attention to the escape from its larval environment, and by the aid of its frontal sac, which it constantly inflates, and the use of its legs, it is able to force its way through a thick layer of material (fæces, &c.) into the open air.

(2) In this stage the frontal sac is contracted, the fly becomes quiescent, air is pumped into the body, the fly increases in size and finally the wings are rapidly developed.

(3) The proboscis is raised from the ventral to its normal position; the wings and integument gradually harden, and the insect takes flight.

During the months of August and September an unremitting search was made for the larvæ in the fæces of various animals and also in farmyard manure, but none were discoverable; but on September 21 the insect was found in all stages in a heap of heated grass mowings, the temperature of which varied from 70° to 98° F. The larvæ occurred in the cooler portions as well as in the older and quite cold deposits, but the eggs were laid in those areas which gave the highest temperatures. The winter is passed in both the larval and pupal stages.

SUMMARY OF LIFE-CYCLE.

Larvæ fed on moist sheeps' dung.

Average day temperature	72° F.
Average night temperature	65° F.
Month	August.

Ova—Incubation period...	2-3 days.
Larval stage	14-21 ,,
Pupal stage	9-13 ,,
Complete cycle	25-37 ,,

Food allowed to partly dry and some light admitted.

Temperatures as above during month of August.

Ova—Incubation period...	2-3 days.
Larval Stage	31-78 ,,
Pupal stage approximately as above.	
Complete cycle	42-78 ,,

Several larvæ of this brood did not pupate before winter.

(*Journal of the Royal Army Medical Corps.*)

SOME DISEASES OF SHEEP AND GOATS IN SOUTH AFRICA.

BY DR. A. THEILER AND C. E. GRAY, M.R.C.V.S.

Heartwater.

This is a specific disease which, as far as we are aware, is indigenous to South Africa, and, as yet, we have only heard of heartwater in Natal and in certain parts of the Transvaal and Cape Colony.

Heartwater is due to a micro-organism living in the blood, but the parasite is invisible, and, as is the case in horse sickness and blue tongue, we are unable to cultivate it on the artificial media in the same way that we can cultivate the germs of the majority of other diseases. Heartwater attacks all domestic ruminants, but we speak more particularly of it in sheep and goats, as it is more commonly a cause of loss in these animals than in cattle. In the case of goats, Angoras seem to contract it more easily than the common Africander goat, bred in the bush veld, which is better able to resist it. Amongst sheep the Merino is the heaviest sufferer, the Africander comes next with slightly less resistance, but Persian sheep, although they can be infected with heartwater, very rarely die of it. This is a noteworthy point of practical value.

Recent investigations by Mr. Lounsbery, Government Entomologist, Cape Colony, have served to show the manner in which the disease is spread—the responsible agent being the bont or tortoise-shell tick. This tick requires in its life-cycle three hosts, namely: (1) During its larval stage, (2) nymphal, and (3) adult stage, and if infected during either the larval or nymphal stage it is capable of infecting a susceptible animal in either the nymphal or adult stage, but it does not transmit the disease through the egg to its progeny, thereby resembling the propagating agent of East Coast fever, and differing from that of ordinary redwater.

A further point of importance is that an animal which has recovered from heartwater is no longer infective, which is not usually the case with most tick-communicated diseases in which the blood remains infective for a very long time after the animal has got over the acute attack.

The time necessary for the completion of the life-cycle of this

tick is about two years. Therefore, an infected veldt may be expected to remain infected for at least that length of time. The disease is more likely to establish itself permanently in low, bushy, and warm country, and not in high, bare and cold districts where the conditions are unfavourable for its development.

Although we know the real agent of the propagation of heartwater, yet, at the present time, we are not in a position to recommend any simple preventive treatment. The destruction of the bont tick would, of course, mean the eradication of heartwater, but, as we noted that it takes about two years before the life-history of this particular tick is finished, it would, therefore, be necessary to keep up the periodic dipping for a very considerable length of time before we can hope to eradicate the insect. This procedure is possible on fenced-in farms, and likely to prove successful, because we have noted animals which have recovered from heartwater are no longer capable of carrying the disease, and by turning immune animals—for preference oxen—into a heartwater field, they would pick up the ticks, which could be killed off by periodical dipping, so that we would eventually arrive at the final eradication of the tick. In the Cape Colony, where whole strips of that country have become almost useless for sheep-breeding on account of heartwater, similar experiments have been made, and, as far as we are aware, with beneficial results.

Certain districts of the Transvaal are also unfit for sheep and goat breeding for the same reason, but we are somewhat reluctant to advise adoption of the foregoing preventive measures on account of the large expense which such a course would entail, and we are of the opinion that in this country, under such conditions, where ordinary sheep and goats do not thrive for this reason, their place should be taken by Persians, which thrive in localities where it is impossible to keep ordinary sheep and goats on account of the prevalence of heartwater.

The problem of introducing a safe and satisfactory method of immunising ordinary sheep and goats against heartwater is still unsolved, and is likely to be a difficult one as the virus of heartwater does not retain its virulency for more than about forty-eight hours, and this will probably prove one of the stumbling-blocks in heartwater inoculation. The principle of the method has been solved, as it is possible to produce a serum which has protective powers. This has been done by immunising cattle with virus of cattle, sheep with virus of sheep, and goats with virus of goats. We have already noted that various strains of heartwater exist, but which do not all immunize one against the other, so that before a successful inoculation can be of practical value, various points have to be elucidated.

Blue Tongue.

This disease resembles horse-sickness in many respects, but, although many farmers consider both diseases as identical, experiments have proved that such is not the case, as sheep do not develop blue tongue when injected with horse-sickness virus, neither can horses be infected with horse-sickness by inoculating them with blood taken from sheep suffering from blue tongue.

It may also be pointed out that blue tongue is found in a higher altitude than horse sickness, so that the carrier which acts as an intermediate host is probably different, although our knowledge con-

cerning the appearance, disappearance, and propagation of blue tongue makes it evident that this disease, like horse-sickness, is carried by a biting insect. Knowledge of this fact suggests that the protection of sheep from attack by this insect should suffice to ward off attacks of the disease, and it has been noted that the higher and drier the sheep are kept, the further they are removed from any pan, vlei or collection of water, the safer they are. On some farms such precautions cannot be followed, and it would, therefore, be desirable to devise a method of inoculation which would insure a certain amount of immunity against a natural attack, and this we have succeeded in accomplishing by the preparation of a vaccine, having noted in our experiments that virus after passing through a number of sheep becomes greatly attenuated, that is to say, it produces a typical blue tongue temperature reaction, but accompanied with either no symptoms or of only to such a slight degree that they are hardly noticed. It now remains to be seen whether this vaccine will protect an animal against natural infection to the same extent that a naturally contracted attack does; we have some reason to hope that it will, and that the immunity will be more or less permanent, as we have found that, as a general rule, one attack of blue tongue immunises against subsequent infection, although we certainly noticed that when young animals, which had previously suffered from blue tongue, were injected with large quantities of virus they then passed through a second attack. From this observation we may infer that a similar occurrence will take place in practice. In other words, the majority of animals inoculated will be protected, whilst a small percentage will break down, but experience alone will show us to what extent these relapses will take place, as it has done in the case of inoculation against horse-sickness.

The vaccine of which we have spoken has been introduced into practice this year for the first time, after having had a thorough test in the Bacteriological Laboratory, where the results proved that no deaths from blue tongue were due to the result of the inoculation of vaccine. It must be remembered that a great deal of care must be taken in the inoculation, because it recently happened in two instances that the virus became contaminated, and produced an unfortunate mortality, from which we have learned that if the inoculation is carried out during a rainy day, or if the sheep are turned into muddy kraals after the injection, infection of the inoculation site may follow with fatal results, and we have, therefore, considered it advisable to issue vaccine this season through the District Veterinary Surgeons, who will give all the instructions and an ocular demonstration of the manner in which the inoculation should be carried out.

Gijlziekte.

Gijlziekte is principally spoken of in sheep all over South Africa, and is chiefly prevalent at the time when the new grass is most luxuriant, and while the young animals are growing quickly. These two observations have been regarded by laymen as the probable cause of the disease; but although the observation is correct, it is capable of a different interpretation. We consider gijlziekte as probably due to abnormal fermentative changes in the first stomach, and it is probable that young grass contains the necessary fermenting material in the most suitable form for the development of certain micro-organisms

which cause this fermentation, with an attendant evolution of gas, which, either by pressure on the lungs or by absorption into the blood, causes the death of the sheep. But whether the micro-organism in question is an ordinary fermenting bacterium or a yeast, and whether it is or is not specific is as yet unsettled.

For this disorder, practical experience in South Africa has found a remedy which certainly has a scientific base, and it is common knowledge that Cooper's Dip is a useful and valuable preventive. This dip is a combination of arsenic and sulphur, and 1 teaspoonful of a mixture in the proportion of 1 part Cooper's Dip to 9 parts salt is usually given as a prophylactic, and it probably prevents the disease, on account of the arsenic being retained in the rumen of an animal for a considerable length of time before it is dissolved, and exercising an anti-fermentative action preventing the multiplication of the micro-organism, and in this way protecting against gijlziekte.

Geel Dikkop.

Long droughts, followed by heavy rains and succeeded by hot weather, are the chief climatic conditions which are responsible for this sheep disease. Flocks after grazing in low-lying velds and vleis under these conditions, and subsequently removed to other spots, occasionally sicken of geel dikkop. It is observed in various parts of the country, but it does not play a very important *rôle* as an epidemic disease, and may be noted more or less according to the climatic conditions of the particular year. In its etiology it has some analogy with such diseases as blue tongue and horse sickness. We are of opinion that the disease belongs to a group which is of malarial character, and which, as we have mentioned before, requires an intermediate host for its propagation. It follows that an outbreak can be checked by moving the diseased flocks to higher altitudes, and by observing the same precautions as are carried out in horse sickness and blue tongue—that is, not to allow them to graze on the grass between about two hours before sunset until a corresponding time after sunrise.

Many causes have been considered as responsible for this disease, and especially plants, the dubbeltje doorn being specially mentioned, but feeding experiments do not bear out this opinion.

This disease also requires further investigation, and we again appeal to farmers to report any cases of this disease for further experiments.

Jagziekte, or Chronic Pneumonia of Sheep.

This is another disease of sheep affecting the lungs, and most common during the winter months. So far, we only know of jagziekte in the western part of the Transvaal, but it has occasionally been reported in the high veld. It is thought that it has some connection with cold and wet, appearing especially during the winter months, but there is every reason to believe that, in addition to this, another condition is required, although, so far, this has not been traced.

Jagziekte is a pneumonia—that is an inflammation of the lungs, but of peculiar character. The affected part becomes quite solid, of a dark colour, firm and friable. In advanced cases, the ordinary lung tissue is replaced by a fibrous growth, which cuts like cartilage. There

is a distinct line of demarcation between the healthy and the completely consolidated parts of the affected lung.

The cause of jagziekte is not yet known, but as there appears to be some reason to believe that it is infectious, it would be advisable to isolate an animal suffering from this disease, or, better still, to destroy it immediately.

This disease requires further investigation, and we would ask farmers to kindly communicate with us whenever a case of jagziekte occurs on their farms.

(*Transvaal Agricultural Journal.*)

Clinical Articles.

ABSCESS OF THE MIDDLE EAR, Etc., IN A MULE.

BY R. FERGUSON STIRLING, M.R.C.V.S., GOVERNMENT VETERINARY SURGEON, GWELO, RHODESIA.

A few mornings ago a transport rider came along to my office and requested me to come immediately to see one of his mules which had been taken ill. On the way along to the place at which the mule was, he told me that a few minutes previously he had sent the boy down with the mule to the river, and when it had finished drinking it began to stagger about.

When we reached the mule I saw that the near ear had been slit down in a barbarous fashion through the conchal and annular cartilages, and that the region below the ear was stained with blood. On my enquiring into the matter, the owner—a Dutchman, by the way—told me that there had been an abscess there, and that he had that morning, about two hours before the animal went to the river, slit this open with a penknife. The blood and matter had run down into the ear; he had not taken it out; he had instead packed in about ¼ lb. of the Dutchman's cure for all ailments, from cutaneous wounds to laminitis, viz., axle grease. On top of this he had stuffed in cotton wool, and had pushed the whole mass as far in as possible.

The appearance of the animal now was very striking. He had lost a great deal of the normal control of movement, and went along in a peculiar, uncertain, staggering way. He showed that high-stepping action similar to that shown in sheep suffering from gid when the offending parasite is situated in the cerebellum. I examined him thoroughly for marks of a bite of a snake or an adder, but could see none.

When we got him to a stable I set about to get this filthy accumulation out of the ear, and with soap and water, followed by ether sulph., I succeeded in getting quite a quantity away. He was by this time becoming comatose, and shortly afterwards became unconscious. I administered strychnine hypodermically and stimulants *per rectum*, but, despite all our efforts, stertor became more and more marked, and he died quietly about ten hours from the time he first became comatose.

Post mortem.—In the middle ear was an accumulation of blood, grease, and abscess products, and in the guttural pouch was a huge mass of an indefinite mixture which may or may not have been of a similar nature. Unfortunately I was unable to have the brain exposed.

TWO UNUSUAL CASES OF COLIC.

BY R. FERGUSON STIRLING, M.R.C.V.S., GOVERNMENT VETERINARY SURGEON, GWELO, RHODESIA.

It is in appreciation of the difficulty which I, a very recent graduate, have experienced in endeavouring to reconcile the symptoms presented in any given case with the symptoms which should be presented according to the text-books, that I am recording these two cases.

The first case occurred whilst I was travelling in the veldt, my conveyance a Cape cart, and my pair a horse and a mule. On the first night of my journey I put up at a farmhouse, and the next morning started off again at sunrise. Apparently the "boy" in charge of the animals had been too lavish with the mealies that morning, as the horse began to get very sluggish and show signs of pain before we had got 12 miles.

I decided to outspan, and immediately on so doing the horse rolled to the ground, rising again almost immediately, and so continued till tympany occurred, when he stood scraping and pawing at the ground. With the aid of a hunting knife and hollowed reed I punctured the cæcum, and then on the advice of the cattle inspector who travelled with me, an old Dutch hunter of renown, I drenched him with a handful of salt in a pint of water. This gave him relief. and in about an hour's time we proceeded on our journey, and having travelled a further distance of 35 miles we reached the lonely station which was our destination.

When I had dined I went out to examine my horse further, and found he had developed the following symptoms: The eyes were dull, membranes injected, pulse frequent and quick, the temperature 104° F. But the strange set of symptoms was in connection with the lips, tongue, palate, and sides of the cheeks, all of which were much swollen and hardened. I drenched him with ol. lini Oi., ol. tereb. ʒii., and started the boy to foment the swollen parts with warm water.

The following morning he was still much swollen, and was still quite unable to swallow water or grasp the food, although he put his head deeply into the river and into the bucket of food, as if he was making vain endeavours to overcome the obstacle to his feeding and drinking. The swelling gradually reduced in size, so that at the end of three days he was able to feed and drink as usual.

The second case occurred in Bulawayo. One Sunday morning a man came up to my house and told me that on the previous evening his pony had been fed with mealies for the first time since he had been in the present owner's possession. A couple of hours afterwards he developed flatulent colic, but under the influence of ol. tereb. ʒii. in milk, and hot cloths to the abdomen this passed away. "But this morning," he continued, "when I went into the stable. his whole head was swollen, especially about the mouth, and I much fear he has got

dikkop." When I rode over to his stables I found that the horse had exactly the same appearance as I had already seen two months previously in the case recorded above.

This case got better in about two days, though at one time I feared tracheotomy would be necessary, owing to the swelling at the fauces interfering seriously with the breathing.

I rather suspected in both cases that they were produced by some poisonous beans or other in the mealies, but although I carefully examined the food on both occasions I could find no trace of foreign foodstuffs.

SNAKE-POISONING IN A COW.

BY R. FERGUSON STIRLING, M.R.C.V.S., GOVERNMENT VETERINARY SURGEON, GWELO, RHODESIA.

A SHORT time ago a man rushed up, just as I was on the point of riding away from my house, to tell me that his cow was dying from a bite of a puff-adder.

I rode over the veldt to his farm at full gallop, and as we approached the place where the cow lay the native boys raised a cry that the cow was dead. This I discovered was wrong, as the man told me that the boy had seen the cow lie down on this puff-adder, and that the latter bit her twice in the groin. The owner rubbed in some kali permang., and came straight away for me.

Symptoms.—The cow was lying fully stretched out with that peculiar appearance of rigidity which is usually seen in cases of tetanus. She was very much inclined to coma, pulse slow and infrequent, membranes dull. On turning her over I found a large swelling situated on the abdominal wall at the side of the udder. Then, strange to say, the second swelling was situated at that point where it is customary to puncture the rumen, and a third close up to the lumbar processes.

Treatment.— Immediately administered a pint of "dop" or Dutch whisky. Scarified the skin by a series of lines about $\frac{1}{8}$ of an inch apart, and intersecting others at right angles. I scarified the three swellings very deeply until the blood flowed copiously. I then had the swellings, now divided up into small squares of skin, bathed with a strong solution of kali permang., followed by the rubbing in of a thick paste of kali permang. crystals and water. I had a third solution of the same drug prepared, and this I injected hypodermically right round the swellings. I then left her, telling the owner to administer a pint of very strong black coffee every hour for four hours. The next day the swelling where she had been bitten had gone down greatly, but the two secondary swellings had increased. These disappeared gradually with the aid of fomentation and massage.

The peculiar point about this case is that the secondary swellings should occur at these points. Although I am aware that there are lymphatic glands situated at the lumbar vertebræ, I do not think there are any subcutaneous glands in the middle of the side of the animal. It is also noteworthy that the nearest glands, namely the superficial and deep inguinals and the mammary lymphatic glands, were not affected in the slightest way.

A NOTE ON THE PRESENCE OF TEMPORARY TEETH AS A MEANS OF JUDGING THE AGE OF A DOG.

BY FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E., KENSINGTON, W.

It is now, I think, a generally recognized fact that the teeth of the dog are by no means *certain* factors as a means of determining the age. At the same time they are always worth consideration, although the milk teeth do not, as in the case of the horse or ox, become shed with absolute regularity at stated times.

In the toy breeds of dogs, particularly the in-bred animals, the first set of teeth, especially the canines, frequently persist for more than twelve months, instead of being shed at an approximate age of six months. To find them in a dog of nine or ten months old is quite common, but the following instance, in which canine milk teeth were present in a dog of three years old is exceptional.

The patient, a black-and-tan toy terrier, had the two lower temporary canines removed with forceps at twelve months old. The right upper canine fell out when the dog was three years and one month old, and the left temporary canine was so tightly fixed at three years and three months old that the forceps had to be used for its extraction.

SOME CANINE CLINICAL NOTES.

BY FREDERICK HOBDAY, F.R.C.V.S., AND EDGAR BELCHER, M.R.C.V.S., KENSINGTON, W.

A Case of Malignant Tumour.

The subject was a St. Bernard bitch, aged 9. She was suffering from a growth on the right knee-joint, said to have been caused by falling down some steps. The growth was treated as such, but instead of subsiding increased gradually in size, and the bitch was evidently in great pain. The owner was informed that the growth was suspected to be of the malignant variety, and that the only course of treatment which was likely to benefit the patient was amputation of the limb above the knee-joint. This operation was accordingly carried out, the wound healing by first intention. An artificial limb was made, and the dog was sent home, where she remained for about a month in apparently good health. An examination of the tumour on the bone revealed that it was a sarcoma arising in connection with the periosteum. After the bitch had been at home four weeks, she was missed one night, and was discovered lying on the wet grass. The next day she was showing symptoms of pneumonia, in which condition she was again brought into hospital. It was ten days before the respiratory symptoms subsided and the appetite returned, and from this time onward a peculiar train of symptoms presented themselves. Her appetite increased, and she was having 1 lb. of meat per day besides milk and other food; but her condition, instead of improving, gradually deteriorated until, at the time of her death, her ribs could be counted through her thick coat, and she was aptly described as "a bag of bones." She was listless and tired, and never moved unless lifted. Diabetes was suggested as an explanation of the condition, but the

absence of polyuria nullified this hypothesis. This progressive emaciation extended over a period of five weeks, and during the third week a small hard nodule was noticed in the left first abdominal mammary gland; it was about the size of a hazel nut, and its surface was irregular to the touch. This tumour increased in size, and during the fifth week was extremely painful to the touch. Towards the end of the fifth week a new symptom was painfully obvious. The bitch appeared to have paroxysms of pain, when she cried out as if in great agony for several seconds, and struggled to rise. This distressing occurrence happened about two or three times in the twenty-four hours, and at the end of two days it was decided to put her away painlessly. This was accordingly done, and the *post-mortem* examination revealed the presence in one of the lungs of two tumours of the same variety as that which had grown on the limb, these varying from about the size of a hazel nut to a walnut respectively. The mammary tumour also turned out to be a small-celled sarcoma. There was no other gross lesion to be found, all the organs being apparently healthy. That sarcomata at an advanced stage sometimes cause great pain is a fact, and the only feasible explanation of the attacks of pain in this case is that the mammary tumour must have been the seat of it, for at least this was painful to the touch, and one would scarcely attribute it to the tumours situated in the lung tissue. There is no doubt that the primary tumour was the one on the bone, since the periosteum is one of the most common seats of primary sarcoma, and it is equally common for the secondary growth to be found in the lung, whither the infection is carried by the venous circulation, which is well developed in this particular variety of tumour. Sarcomata, in contradistinction to carcinomata, rarely invade the lymphatics. Probably, if the limb had been amputated as soon as the growth was noticed, no secondary tumours would have occurred.

CARCINOMA OF THE ŒSOPHAGUS IN AN AGED FOXTERRIER DOG.

This dog enjoyed good health until about the beginning of March last, when the owner noticed that he was not feeding properly and was dull. In a few days he commenced vomiting occasionally. The case was diagnosed as gastritis, so common in old dogs, and was treated as such, no swelling in the throat being observed. For a fortnight this treatment was continued by an unqualified man who was attending the case. The dog was getting weaker, could take very little food, and was generally very much "out of sorts." It was now observed that there was a slight swelling about the middle of the throat which was thought to be due to an obstruction, probably a bone, in the gullet. The dog was accordingly brought up to hospital with the idea of an operation for the removal of the obstruction. The swelling at this time had reached the size of a Tangerine orange, causing the dog to hold his head to the right side. The animal, usually snappish with strangers, was now quite quiet, and gave evidence of slight pain when the swelling was pressed. There was no salivation, and no bad smell from the mouth. The surface of the lump was irregular and rough, it was freely movable under the skin, and situated clear of the trachea in the jugular furrow; on manipulation it gave one the idea of its being attached to the œsophagus.

Diagnosis.—Taking into consideration the facts that, so far as was

known, the gullet had never been obstructed, as would have happened had there been a bone there, the general marked cachexia, and the frequency with which the œsophagus is the seat of cancer, the trouble was diagnosed as this dread disease, and the dog was put painlessly away with chloroform, but during the night before this was done he was heard on several occasions to cry out loudly as if in great pain, in this respect resembling the St. Bernard bitch of the previous case.

Post-mortem Examination.—The skin was incised over the tumour, and the swelling was found to involve some of the voluntary muscles, but on dissecting the mass out the root was found in connection with the membrane lining the œsophagus. The tumour was undoubtedly a cancer, and, arising as it did from a squamous-celled epithelium, was no doubt of the squamous-celled variety.

In both these cases the growth of the tumour was very rapid, and there was the cachexia so characteristic of these malignant growths.

An Interesting Case of Ascites followed by Carcinoma of the Pharynx and Cervical Glands.

The subject was a skye terrier, aged 12, and was first seen in May, 1907. His abdomen was distinctly dropsical, but as he appeared to suffer no discomfort he was put on potassium iodide until December, when it was found necessary to draw off the fluid. Nine pints of a straw-coloured fluid were removed. The fluid did not return, and the dog enjoyed good health until February, 1908, when it was noticed that it did not take its food readily, and appeared to have a sore throat. Examination of the throat revealed a subcutaneous and freely-movable tumour about the size of a chestnut behind the angle of the jaw on the left side. As this gave rise to a suspicion of carcinoma, the fauces were examined, while the mouth was kept open with a speculum, and it was noticed that the mucous membrane on the left side was distinctly ulcerated. This confirmed the diagnosis, and the dog was painlessly destroyed. The tumour was submitted to Sir John McFadyean for examination, and his report proved the diagnosis to have been correct.

Three Cases of Prolapse of the Bowel; Amputation; Proctopexia.

The unusual character of these cases lies in the circumstances that they all occurred in one stud of some twenty bulldogs, all the three dogs were of the same strain, and the three cases occurred almost simultaneously.

Case 1.—Bulldog, aged 10 months. When first brought to our notice on January 22, 1908, the prolapsed portion of the bowel was the size of a man's fist, and was quite dry and nearly black, had evidently been out some considerable time. The dog was lively, and did not appear to be inconvenienced by it. Within two hours the dog was rendered quiet by means of an injection of morphia, and the piece of bowel was excised after first suturing the healthy part to the anal ring. The dog recovered from the effects of the morphia, but died twenty-four hours later, probably from the absorption of toxic products of the gangrene of the bowel.

Post-mortem examination revealed the protruded bowel to have consisted of an intussusception of the large bowel.

Case 2.—Bull-bitch, aged 2 years, was brought into hospital on January 25, 1908: that is, three days after the former case. The length of the bowel protrusion was about 2 in., and it was quite recent, being moist and red. The bowel was readily returned, but failed to keep its position, and after several attempts to keep it in its place by means of cold injections containing 10 grains of tannic acid as an astringent, a purse-string suture was put in, and the bitch was put under morphia (1 grain). This suture was removed after about five days, and the bowel was never again protruded, but the patient began to lose appetite, could not be tempted to take anything to eat, and the temperature ran up to 103·5 F., and varied considerably during the course of each day, but after three days was never above normal, and after one week began to be subnormal. The material that passed from the bowel was dark, blood-stained in colour, and nearly fluid in consistency, but, except during the last few days of her life, was never of a bad smell. This condition of things continued for ten days after the removal of the suture, the bitch gradually getting thinner, and having the haggard and miserable expression of face which usually accompanies enteritis. As regards treatment during this period, she was fed on Brand's essence of meat, and was given as medicine ¼ grain of carbolic acid, together with chloroform water and 2 mm. of Tinc. Card. co. every four hours, and about 20 mm. of brandy every alternate four hours. Cold starch enemas four times a day were tried with 10 mm. of tinct. opii, but, despite all this, the prognosis was unfavourable, and she died on the seventeenth day after the prolapse was first noticed.

An examination of the body after death revealed the fact that the bowel was very severely inflamed for a distance of 6 in. from the anus, but there was no intussusception, nor was there any peritonitis.

Gersuney's Operation and Proctopexia.

Case 3.—The subject was a well-bred bulldog about 18 months old, who was brought to hospital on the morning of March 26, 1908, with about 2½ in. of his rectum protruding from the anus. The prolapsed portion was quite fresh, being moist and red, and had evidently not been out more than an hour or so. The kennelman was closely questioned as to the feeding of the dogs, seeing that these three cases had occurred so close together, but said they had had no change in food, and also declared, when asked if he had dosed the dogs, that he had not given them any medicine except a dose of castor oil to several of the dogs, including this one, about four days previously, which had had the desired effect.

The prolapsed bowel, on examination, was found to be soft, and was easily returned with the fingers. Immediately after the bowel had been returned the dog was rendered quiet by a hypodermic injection of 1 gr. of morphia, the value of which drug cannot be overestimated in such cases, for by means of it the patient is kept perfectly quiet for twelve to eighteen hours. The only food allowed was suet pudding in small quantity (about 4 oz.) three times a day. The bowel remained in position, and the dog was sent home in six days. But three days later the dog was back again in a similar condition to that when first seen. Again the prolapsed bowel was returned to its normal position, but without success; in half an hour the condition was as bad as ever,

This proceeding was repeated two or three times, always with the same result, and it was decided to perform Gersuney's operation. Accordingly the dog was put under the effect of 2 gr. of morphia, and four columns of sterile wax were injected, with aseptic precautions, under the skin near the anus and alongside the rectum. The result was an entire failure, the prolapse recurring within an hour.

Under the circumstances, the only course open which was likely to benefit the patient was to perform a laparotomy and suture the bowel to the abdominal wall. This operation (proctopexia) was accordingly carried out within two hours of the wax injection, and while the subject was still under the effect of the morphia given nearly three hours previously. The result has been an unqualified success, and up to the present time, one month after the operation, there has not been the slightest sign of the return of the trouble. The wound has healed, the dog is eating well and in good health, his bowels move regularly, and he has no difficulty in defæcating.

There is no doubt that the condition was brought about by some drug (probably laxative) which had been administered, although the kennelman denies having administered anything but the castor oil above mentioned. Bulldogs are certainly more liable to this condition than most other breeds, but it is usually met with in puppies or in old dogs, and the occurrence of these cases in middle-aged dogs points to the action of some irritant which would cause purging and consequent straining.

Abstracts and Reports.

THE HUMANE SLAUGHTERING OF ANIMALS.

The Local Government Board have recently had under consideration the question of the slaughtering of animals in slaughter-houses in connection with the report of the Committee appointed by the Admiralty upon the subject of the humane slaughtering of animals, and they draw attention to the subject, and especially to certain recommendations made by that Committee as to methods of slaughter. Under the terms of the reference the investigations by the Committee related to the following animals, viz., cattle, calves, sheep, lambs, and pigs. The Committee suggested the universal enforcement of the following regulations:—

(1) All animals, without exception, must be stunned, or otherwise rendered unconscious, before blood is drawn;

(2) Animals awaiting slaughter must be so placed that they cannot see into the slaughter-house, and the doors of the latter must be kept closed whilst slaughtering is going on;

(3) The drainage of the slaughter-house must be so arranged that no blood or other refuse can flow out within sight or smell of animals awaiting slaughter, and no such refuse shall be deposited in proximity to the waiting-pens;

(4) If more animals than one are being slaughtered in one slaughter-house at the same time, they must not be within view of each other;

(5) None but licensed men shall be employed in or about slaughter-houses.

Many urban district councils, and some rural district councils possessing the necessary powers, have, under the provisions of the Public Health Act, 1875, made a byelaw for preventing cruelty in slaughter-houses. This byelaw is usually based on one of the Board's Model Byelaws, which provides: "Every occupier of a slaughter-house and every servant of such occupier and every other person employed upon the premises in the slaughtering of cattle shall, before proceeding to slaughter any bull, ox, cow, heifer, or steer, cause the head of such animal to be securely fastened so as to enable such animal to be felled with as little pain or suffering as practicable, and shall in the process of slaughtering any animal use such instruments and appliances and adopt such method of slaughtering and otherwise take such precautions as may be requisite to secure the infliction of as little pain or suffering as practicable."

Whilst this byelaw is intended to secure the humane slaughtering of animals, it does not require "stunning in all cases" as recommended by the Committee. The Board think that byelaws requiring animals to be stunned before slaughter may be made both under the first paragraph of Section 169 of the Public Health Act, 1875, as regards slaughter-houses provided by a local authority, and under Section 128 of the Towns Improvement Clauses Act, 1847, as incorporated by the second paragraph of that Section, for the regulation of private slaughter-houses, and they are prepared to consider applications for the confirmation of such byelaws.

It must, however, be remembered that attempts at stunning, carelessly or unskilfully made, may be the means of inflicting, instead of avoiding, unnecessary pain; and hence the Board suggest that, before making a byelaw requiring the stunning of any animals other than horned cattle, the local authority should ascertain how far the butchers in the district are prepared to carry out the practice. In relation to this question the Board have been advised by the Board of Agriculture and Fisheries that they would see no objection to a byelaw requiring the stunning of pigs or calves, but that the stunning of sheep is a difficult operation, in the carrying out of which cruelty might easily occur. On the other hand, the Admiralty Committee satisfied themselves that sheep can be stunned expeditiously and without difficulty, by striking them on top of the head between the ears—not on the forehead—with a small club having a heavy head; and they state that in Denmark, many parts of Germany, and Switzerland, the law requires that sheep shall always be stunned previous to being stuck. But while the practice of stunning sheep may be a proper one to adopt in public abattoirs, where it will be carried out by skilled slaughtermen, the Board doubt whether it is advisable to require its adoption in private establishments unless there is reasonable ground for believing that it will be properly performed.

In some cases it may be necessary to include in such a series of byelaws a provision allowing the Jewish method of slaughter. The Board have recently confirmed the following byelaw for the Corporation of Liverpool: "No person shall proceed to slaughter any bull, ox, cow, heifer, calf, or pig, until the same shall have been effectually stunned. Provided that this requirement shall not be deemed to apply

to any member of the Jewish faith, duly licensed by the Chief Rabbi as a slaughterer, when engaged in the slaughtering of cattle intended for the food of Jews according to the Jewish method of slaughtering, if no unnecessary suffering is inflicted."

In connection with the recommendations (1), (2), and (3), the Committee observe:—

"The animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughter-house itself.

"There is no point which the Committee have more carefully investigated than the question as to whether animals do or do not suffer fear from this contact, and the evidence of those best qualified to judge is so conflicting that no absolute verdict can be given. As an animal cannot speak, it is impossible to accurately determine to what extent it does or does not suffer from fear; but there is no doubt that cattle, especially, frequently show great reluctance to entering the slaughter-chamber, and can only be dragged in by the employment of considerable force. The presumption is that what they chiefly object to is the smell of blood, but whether this can be proved or not, it is obviously undesirable from a purely business standpoint to run any risk, as it appears to be an established fact that the flesh of an animal, killed whilst in a state of fear or excitement, loses some of its palatable and marketable qualities.

"Apart from this, the question is of such vital importance from the standpoint of humanity that it seems clear that the animal should be given the full benefit of the doubt.

"With this object in view, the waiting-pens should be separated from the slaughter-chamber, and the latter should be shut off by sliding doors.

"It is also of great importance that the pitch of the floor and the drainage of the slaughter-chamber should be away from, and not run into the waiting-pens, as is often the case at present. The common practice of depositing blood barrels, freshly removed hides, or refuse from the slaughter-house in close proximity to the waiting-pens should also be prohibited. . . . Cattle should, when possible, be slaughtered screened off from their fellows."

REPORT ON THE GOATS ILL WITH MEDITERRANEAN FEVER BOUGHT IN APRIL, 1906, AND ON THE KIDS BORN OF SOME OF THEM AT THE LAZARETTO.[1]

BY DR. T. ZAMMIT, PUBLIC HEALTH DEPARTMENT, MALTA, MEMBER OF THE LATE COMMISSION ON MEDITERRANEAN FEVER.

THE goats ill with Mediterranean Fever, bought by the Commission on Mediterranean fever in April, 1906, were kept for nearly a year at the Lazaretto with the view mainly to observe whether they would get better, or whether they would in time shake off the fever altogether. Later on I thought that it would be worth while to have these

[1] From the *Journal of the Royal Army Medical Corps.*

goats impregnated again, with a view to observe whether kids born from infected mothers would have acquired immunity against Mediterranean fever. The results of these observations are here tabulated.

For the sake of comparison, five kids were bought, born outside the Lazaretto, of presumably healthy mothers, and of the same age as the kids born of our infected goats. Of the eleven animals, four, including the sheep, remained barren, but of these, two continued to yield milk, which was tested, to the last; the other two dried up by September

The sheep (No. 107), which had always proved to be badly infected, remained saturated with *Micrococcus melitensis* to the last. Its milk yielded throughout a large number of cocci, and at the *post-mortem* examination *M. melitensis* was abundantly obtained from practically all organs (spleen, liver, inguinal and mesenteric glands). This sheep, therefore, found infected in April, 1906, never got better up to August, 1907, when it was slaughtered, a period of sixteen months, without, of course, taking into account the unknown period for which it was ill before it was examined. The animal during all this time showed no objective signs of disease; it never lost flesh, it fed well, and gave abundant milk, which looked normal till it became watery and then disappeared in January, 1907. At the *post-mortem* examination the animal looked normal and very fat, the veterinary surgeon declaring it a first-rate sheep, although he knew that it had yielded *M. melitensis* freely in its milk for months. A few sublumbar glands were found congested, even hæmorrhagic in parts, though not much enlarged. All the other glands looked normal but enlarged.

The same can be said of the goat No. 117. This animal kept lively and well all through, and gave a first-rate carcase, though *M. melitensis* was discovered in great abundance in all glands (inguinal, mesenteric and mammary.)

The goat No. 115 died in January, 1907, and as putrefaction had set in when it was brought over to the Lazaretto no *post-mortem* was possible. It had been ill for some time and had ceased to lactate.

The goat No 104 had dried up at an early date, and had remained barren. No *M. melitensis* had been obtained from its milk before it dried up, and its blood had ceased to react. At the *post-mortem* examination it looked quite normal, and no *M. melitensis* was obtained from any of the organs examined. To all intents and purposes the goat appeared cured of its attack of Mediterranean fever.

The rest of the goats had a regular pregnancy and dropped from one to four kids in due time. One of them (No. 114) died of septicæmia after dropping three kids. The goats suckled their kids and kept quite well; their blood and their milk reacted more or less all the time, except for No. 112, which persistently gave no reaction, although *M. melitensis* was recovered from its milk twice in March (100 and 50 colonies per 0·1 cc.) and once in May (39 colonies per 0·1 cc.).

At the slaughtering of these goats sixteen months after their being discovered to be infected and six months after delivery, the infection had greatly subsided. Nos. 101 and 102 yielded no *M. melitensis* at the *post-mortem* examination, though No. 101 had *M. melitensis* in the milk in April (fifteen colonies), and its blood had shown throughout a positive reaction. No. 110 also gave negative results at the *post mortem*, but its blood showed a strong reaction, and colonies of *M.*

melitensis were abundant in its milk not earlier than May and June (69 and 300 colonies). No. 113 was the most curious of the series. Its milk and blood had persistently reacted throughout, and for about two weeks in June (two months before the *post mortem*) had yielded as much as 200 colonies per 0·1 cc. of milk, yet no *M. melitensis* could be recovered from any of its organs. The only goat that showed *M. melitensis* at the *post mortem* was No. 111, and that in a very unexpected manner. The animal had given positive reaction both in its milk and in its blood during life, and had excreted *M. melitensis* in its milk since February, 1906. No *M. melitensis* was recovered from the milk from April to June 12, but up to June 22 the colonies were very numerous, over 1,000 per 0·1 cc. At the *post mortem M. melitensis* was obtained only from the inguinal glands.

From these observations I think it is fair to conclude that goats once infected with Mediterranean fever very rarely, if ever, shake it off, and also that infected goats are a constant danger, as they are apt to yield infected milk unexpectedly. Another very interesting observation is that, although as a rule an infected milk reacts when tested like blood serum for agglutination with *M. melitensis*, cases were observed in which a milk full of micrococci failed to give the agglutination reaction. One feels also bound to remark that of the eleven goats examined Nos. 107, 111, and 117 only gave colonies of *M. melitensis* at the *post mortem*, and of these Nos. 111 and 117 had been treated by injection of dead colonies of *M. melitensis* about a year previously. The goats thus treated were Nos. 104, 111, 114, and 117.

Report on the Observations made on Kids Fed on Infected Milk.

Seven infected goats dropped kids at the Lazaretto in February and March, 1907.

Goat No.	101	dropped	1	kid
,, ,,	108	,,	2	kids
,, ,,	110	,,	2	,,
,, ,,	111	,,	1	kid
,, ,,	112	,,	2	kids
,, ,,	113	,,	4	,,
,, ,,	114	,,	3	,, (one died *in utero*)

When more than one kid was born, one was killed and examined immediately. When only one was born, it was allowed to live for further observation. The kids were given the number of their mother, so that the case could be followed more clearly. The kids were allowed to suck their mothers, and only when the mother died were the kids suckled by another goat.

The main point to be observed was whether a kid born of an infected mother acquired immunity to *M. melitensis* infection. For this purpose five kids were bought of approximately the same age as those born at the Lazaretto (about 4 months) for the purpose of comparison. The Lazaretto kids were left with their dams for nearly four months, when they were able to feed on clover, cotton-seed, and beans. At this time all the kids were given milk from an infected goat in two doses, one draught in the evening and one next morning. Afterwards they were finally separated from the dams. Since goats No. 111 and

113 yielded infected milk, they were selected to give the milk for this experiment. As, however, goat No. 113 failed quite suddenly to give infected milk, to be on the safe side all the kids fed on the milk of goat No. 113 were fed twice again on the milk of goat No. 111, which contained *M. melitensis* as before. All the kids killed and examined soon after birth were found to be free from infection; their blood did not react, and no *M. melitensis* was recovered from their organs and glands. None of the kids showed a reaction in their blood immediately after birth, but some of them developed the reaction soon after. The parallelism of the reaction of kid and mother was not maintained.

From two months after their birth up to their death, none of the kids showed any reaction in their blood. In August, three of the kids developed diarrhœa, and were nearly dying when they were killed and carefully examined: No. 101, bowels congested and mesenteric glands enlarged. No. 114, intestines inflamed, pericardium full of serum, and mesenteric glands enlarged. No. 22, intestines highly congested, stomach full of undigested food, gall-bladder distended with glairy bile, and kidneys much congested. No *M. melitensis* was obtained from any of the organs.

Between the 1st and the 10th of October all the kids were slaughtered and carefully examined. They all appeared in perfect condition and moderately fat. The organs in all looked perfectly healthy; the spleen was normal, except in Nos. 16 and 17, in which it was friable and juicy. Agar plates were smeared with material taken from spleen, liver, kidney, inguinal and mesenteric glands, and heart. Numerous growths were obtained from No. 16 from spleen, liver, inguinal and mesenteric glands. From No. 108 a few colonies were found on the plate smeared with a portion of kidney; all the other plates showed no *M. melitensis* growth. None of the other kids gave colonies of *M. melitensis*.

The growths from No. 108 were quite unexpected, as the kid had never reacted to *M. melitensis* during life, and no growth was obtained from the spleen and glands, which are much more likely to contain the microbe. Still, the infection of this kid could in no way be compared with that of No. 16, which gave a pure culture of *M. melitensis* in a great number of plates, and which had shown a good serum reaction during life. Of course the finding of the few colonies in No. 108 does not allow one to affirm that the kids born of infected mothers had acquired immunity; but, taking all the circumstances together, one can easily see that the four kids bought outside the Lazaretto showed signs of infection, Nos. 7, 16 and 17 giving a clear reaction all the time, whilst in the Lazaretto kids the serum reaction was never evident.

In conclusion, I think that this experiment gives us *prima facie* evidence that kids born of infected dams have a certain degree of immunity to Mediterranean fever infection. If the experiment be repeated on a larger scale and my conclusions confirmed, a clue to the grave problem of freeing Malta from infected goats may have been found, as it will be a comparatively easy task to replace infected goats by immune kids.

THE CONSTRUCTION OF PIGSTIES.[1]

THE importance of having sound, healthy, and suitable housing for pigs is overlooked, or not understood, by a very large number of pig-owners, many of whom can least afford to waste their money by uneconomical methods. Many members of the working classes, and not a few farmers, by bringing up the animals in cold, damp and dirty surroundings, are actually throwing away a great part of their labour and trouble, and even running the risk of losing the swine altogether. It is the foul, badly-built sty which in bad weather becomes a quag-mire, which harbours the germs of disease that too often spreads through the neighbourhood, and cannot be suppressed for years. But even where no actual disease appears all experience shows that swine kept under good conditions thrive better and fatten quicker than those kept in filthy surroundings. The labour and expense of building a good sty, and of keeping it properly, are repaid in a very short time.

Before laying down any rules about how to go to work the different circumstances under which pigs are kept must be considered. Some pig-owners live in urban centres where ground is valuable and in demand, not only for gardens and allotments, but also for building houses. It is obviously useless to build an expensive sty on land which is likely to be used for other purposes in a short time. Other owners live in country places where land is plentiful, but building material scarce and troublesome to get. In such cases the owner must use what he can find. Sometimes stone is easily procured, sometimes bricks, and sometimes neither. The size and kind of pig-house must depend on the class of pig-rearing that is practised in the district, and the plans must be adapted to meet the different requirements of breeding or fattening. If the pig-owner lives in a dairying county, a wheat-growing district, or a potato-growing centre, he must modify his plans to suit the wants and customs of such a neighbourhood; he must not think, for example, of putting a large white Yorkshire sow into a sty which would be just suitable for one of the small breeds.

POINTS TO BE OBSERVED.

In every case the man who sets about building a sty must aim at getting as much sunlight, fresh air, and dry footing as he can, and, if circumstances make it impossible for him to get all three requirements, he had better not build the sty at all.

The simplest way of dealing with the question of how to build useful, sound and cheap housing for pigs is to begin with the case of the workman or labourer who, for varying reasons, has only need for one sty, and to lead up from this to a description of a more elaborate piggery where many swine—and those of all ages and sizes—are kept, and where the expenditure is a somewhat less serious consideration.

(1) The most important part of every sty is the floor, and every effort should be made to see that this is in all respects satisfactory, even if the rest of the building has to suffer a little. Swine can keep healthy and grow fat in a poor house if the floor is well made, but there is great danger of their pining and falling sick on a cold, damp

[1] Leaflet issued by the Board of Agriculture and Fisheries.

floor even if they have a magnificent roof over their heads. A broken floor in which puddles of rain-water or urine can lie is a breeding-place for sickness and parasites of all sorts; moreover, it gives the pig an opportunity of rooting, which he will generally be prompt to do, often not stopping till nearly the whole of the floor is upturned. The floor, therefore, must be made of some hard substance which is not brittle and does not too readily break up. The best material for this purpose is concrete or Portland cement, though a useful flooring may also be made with a mixture of tar and gravel, stamped and rammed into a solid block. Care must, however, be taken in this case not to let it be too long exposed to the sun's rays, lest the tar melt and make the whole surface soft. Bricks cannot be recommended unless they are new and unbroken, and are laid in cement at least 6 in. deep, and even then they are liable to chip and crack. Stone flags are bad, as the manure sinks in between the joints and makes the soil beneath impure, while wooden floors, unless movable, are wholly to be condemned as dangerous and mischievous in the last degree. Concrete should therefore be used whenever possible.

The preparation of a concrete or cement floor is well within the means of every workman who can afford to buy a pig, and it is not difficult to make. It should be laid with a gentle slope towards the front of the sty, and it is advisable to make the top of the outer court lower than the bottom of the inner court by about 2 in. There will thus be a small step between the two courts, which will enable drainage water to fall with a rush and run away more rapidly. The object is to secure dryness under foot, for, as has been already said, this is not only more healthy for the pig, but it helps to keep the floor from splitting or breaking away. Small channels should also be made in the cement before it has hardened, and these should run diagonally, in parallel lines, and not cutting across each other in the way that is termed cross-hatching. These diagonals or sloping lines should run from right to left on the inner court, and from left to right in the outer court. The reason for this will be given later on. Before leaving this subject it is as well to emphasize this point: The slope of the floor should not be so great as to make it slippery, lest the pigs on running out to their food should hurt themselves, and for the same reason the surface of the cement between the channels should be left slightly rough.

(2) The next point to be considered is that of the walls. These are too often made of wood, which is generally an unsuitable material, and should only be used when nothing better is to be obtained. Old planks and parts of packing-cases or boxes are to be condemned, though railway sleepers (if in good condition and well bedded) are very serviceable, especially if an additional coating of tar is given to preserve them. Bricks, however, make the best kind of wall, and should be employed where possible, if only for the lower part of the building. A wooden fence may be well built on the top of two or three suitably laid rows of bricks. The jointure of the wall and the floor should be carefully attended to, as, if moisture gets in, the floor may be broken and the whole work wasted. It is advisable, therefore, to add a little cement sill at the bottom of the wall to fill up the angle, and make the water run away into the channels. If bricks cannot be obtained—and there are many places where bricks are scarce—stone flags may be set upright and made into a sort of paling. This is done in many parts

of Lancashire. But if neither brick nor stone is available, and it is considered too expensive to build a concrete wall, wood must be used. In that case a sheet of zinc or iron should be screwed on the wooden walls inside the pigsty to preserve them from damp and from destruction by the pigs. Walls should be firmly built, and care should be taken not to build them so high as to shut out the light and air from the swine; a few gaps may be left outside provided that they are small enough to prevent the entrance of rats. The gaps should not be so numerous as to prevent the walls being a protection against the wind and the cold.

(3) The walls being built, it only remains to add the roof. This should be raised well above the floor of the inner court, leaving room for plenty of fresh air, without which the pig-sty becomes very foul and liable to spread disease. The roof should, in fact, be high enough in at least one place to enable a man to stand up when he is cleaning the floor. This can be easily arranged in the kind of shed known as the "lean-to," which is the most popular form. The material of which the roof is made is of no great importance, provided that it keeps out the wet and cold. Tiles, slates, or thatch may be used, and in many parts of Yorkshire tarred brattice cloth is commonly employed. Iron, however, should not be used, at any rate alone, as it lets in the heat in summer and the cold in winter. A window is strongly recommended for the purpose of letting in light, and a pane of glass should certainly be let into the wall or the roof if a proper window cannot be built. It cannot be too often repeated that light, warmth, dryness, and cleanliness are necessary for the profitable keeping of pigs.

In the description that has been given it has been assumed that the inner court stands four square behind the outer court from the point of view of a person looking over the wall at the bottom of the sty. The entrance from the outer to the inner court should be on the left-hand side from the same standpoint, and the pig's bed, therefore, will be on the right-hand side, or the innermost part of the whole sty. A healthy pig seldom leaves any droppings or water in its bed, but in case any liquid should get there, it is as well to make a small drain running straight from the place where the bed is put to the outer court, and so on to the bottom of the sty. The bed should be a very low platform of wood, raised just high enough to allow free ventilation, and should be covered with plenty of straw, bracken, or other litter, which should be kept fresh. If the sow is about to litter, a piece of piping should be fixed a few inches from the wall to prevent her overlaying her young. The inner court may now be considered complete.

Drainage.

In the outer court the drainages should run down to the right-hand side, as already said, and that for two reasons. In the first place the pig's trough should be at the bottom of the sty, on the left-hand, in order that the pig may come straight out of the inner court to the food. This trough should be made of earthenware or iron, and should be firmly fastened to the ground. Just over this trough should be a hole in the wall, with a falling door made of iron, so fitted that the pig's food can be poured straight into the trough without entering the sty. If this is thought too expensive, an earthenware pipe might be fixed in the wall, slanting at such an angle that all food poured in at one

end must run into the trough. Care should be taken to keep the trough and the pipe clean and sweet. On the right-hand side, at the bottom, should be the gate leading into the outer court, and the drain should run straight down from the pig's bed to this gate, and this is another reason why the drainage should run to the right. But when collected there it should not be allowed to lie, but should be led away by an open drain to a sump at some distance, far enough off at least to keep the sty fresh and clean.

The outer door must be strong; it would be a foolish waste to build good walls and then hang a rickety gate. It is only necessary to say that if it be of wood a plate of iron or zinc should be screwed on to the inside to prevent its destruction by the pig. Some people advise a door between the inner and the outer court, but, though advantageous, this is not necessary. If it is added it should be made in two parts, an upper which can be bolted at pleasure, and a lower which swings freely without quite touching the ground.

The above description applies to the building of a single sty, but more sties may be erected on the same model, side by side with each other, without any alteration. Each sty should have a separate drain as described above, and it it false economy to make one drain pass through all the sties, as is sometimes arranged. It is really dearer, for the sty through which the drain passes last is usually wet and unhealthy, and if disease breaks out in the top sty, all the swine are likely to be affected. An excellent method is to put the sties back to back, with a small gangway between, down which a man can walk, and from which he can see if the swine are faring well, or climb over the wall to clean out their beds. This plan has also the advantage that it gives more air to the inner courts of the sties. It is, perhaps, as well to add that if a number of pigs are kept in one sty the trough should be so arranged as to prevent the animals crowding one another.

If a really large number of swine are kept, it is very desirable that the piggeries should not be all together. It is advisable to have several sties in different parts of the farm, with separate sheds for the boars, the in-pig or farrowing sows, the stores, and the fat pigs. There should also be an isolated shed, into which a pig can be put if noticed to be amiss or off feed for more than a single meal. It is a serious matter to get swine-fever into a valuable herd, and precautions should be taken at once to isolate the infected animal, as well as to notify the fact in the way provided by the law.

THE PLACE OF VETERINARY MEDICINE IN STATE EDUCATION.[1]

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THE German poet Heinrich Heine, somewhere in his writings, importunes men not to neglect to hearken to the "Zeit-geist," the Time Spirit, if they are to make their energies potential in their day and generation. For my part I do not pretend to have anything of prophecy in me, nor come I from a "school of the prophets." Hence I

[1] Abstract from the *Proceedings of the American Veterinary Medical Association.*

do not dare to predict what the honeyed future may have in store for us. Nevertheless, the part of wisdom is to consider what the politicians call "the issues of the day," which, for us, are the veterinary issues of the day, leaving to posterity the fruits of our labour.

Of all the questions which vex us, governmental and legal ones most concern us. Look at them! The military veterinarian has not his right status, for the reason given that the Government does not yet appreciate his full worth. Fakirs and quacks are abroad in the land, for the reason given that State Governments do not put an iron hand on them. Practitioners in the States are not at all sufficiently protected, because of the reason given that the State Legislatures have not passed adequate laws. Veterinary sanitary police work in the States is insufficient, for the reason given that legislative authority granted to us is wanting. Many of the States make no provision for the training of veterinarians, for the reason that the Legislatures are yet dead as door nails to its necessity.

If it were not that the American Government, from its foundation, has stood fast for public education; if it were not that agricultural education was knit, by Congressional enactments, into the warp and woof of that public education; if it were not that, in those fundamental Congressional Acts, veterinary medicine was mentioned as a cardinal subject for training; if it were not that veterinary science has thus found its place in the State agricultural education adopted, I would be able to find no reasonable ground for hope that veterinary science would shortly find a larger scope in the several States, and that, eventually, most of them would have veterinary courses in their State institutions for the training of veterinarians. But veterinary medicine has found its place in State education. At least nine States —New York, Pennsylvania, Ohio, Michigan, Kansas, Iowa, Colorado, Washington, and Alabama—have declared themselves prepared to train their own veterinarians. As many more States could be named which, by virtue of the commendable zeal of their veterinary leaders at the State colleges or universities, have veterinary courses even now, which, when taken together with collateral sciences electable at the same institutions, would give a better training than that obtainable in some "recognized" veterinary colleges, though these State institutions have not yet declared themselves ready to train their own veterinarians. I refer to such States as Virginia, Texas, Missouri, North Dakota, Minnesota and Wisconsin. The signs of the times point to the establishment of full veterinary courses in these or other State institutions where the field is ripe for a change. No other governmental question, therefore, more deserves the attention of this assembly than that which constitutes my theme, "The Place of Veterinary Medicine in State Education."

This brings me to the proposition I wish to advance this morning, namely, that it is the duty of each State to train its own veterinarians; to define the conditions under which they shall be allowed to enter upon veterinary work within the State, or remain in that work; to defend their interests by legislative enactment.

Through the leavening effect of the work of men of this profession, the conviction is becoming deep-seated in the minds of the American people, in many of the more enlightened States, that veterinary education should be free; that veterinary knowledge should be imparted at

State institutions; that a degree in veterinary medicine should be conferred, and that professional men should be turned out therefrom to treat farm animals. To show you that this view is not chimerical, I point to the fact that the State of Michigan has, within a few weeks, empowered its Secretary of Agriculture to start a veterinary department, in connection with its famous College of Agriculture, and a course leading to the veterinary degree. Earlier in the year, Alabama and Colorado did much the same thing, both of which will establish veterinary courses leading to the degree. It is patent that, in so doing, these States were only doing their bounden duty to the agricultural interests. A survey of the present tendencies in public education in the United States will discover to any thoughtful man that State veterinary education, whereby men will be trained for work within the States, will be accomplished either by adding a Department of Veterinary Science at the State Agricultural College, as in Iowa, Alabama, Colorado, Michigan, and Washington; or by establishing a separate State Veterinary College, under the trustees of the State University, as was done in New York and Ohio; or by adding a Department of Veterinary Medicine at a State University, as was done in Pennsylvania.

State veterinary institutions, moreover, seem at present to receive the smiles and blandishments of fortune; whereas she refuses just now to coquette with any other form of veterinary school. It is conceivable that private veterinary schools might be placed beyond criticism, even by a man like Dr. Merillat, who knows them so well, provided they could be made the recipients of a large endowment from philanthropists, in the same manner as great schools of human medicine have been endowed. Their fortune being assured, from interest on endowment and student fees, they might be able to pass muster, even before the eyes of the acutest critic. If this could be done, every man in this assembly would throw up his hat with joy. I would throw up my own hat higher than anyone. Unfortunately, as far as I can learn, not one of them but must depend upon student fees for existence, for all have yet failed to successfully appeal to the purse of the rich. On the other hand, the library of the State Veterinary College of New York received $15,000 from the estate of the late Governor Flower towards its endowment, and the Veterinary Department of the University of Pennsylvania recently received $150,000 from private sources for use as an endowment fund. The site for the new buildings cost $50,000, which was provided by the university. The State has given additionally $200,000. In other words, the idea of State veterinary education appeals to the rich as well as to the general public.

These fortunate events do not come haphazard. They are the result of untiring labours of zealous veterinarians, who count no professional effort as loss, but who press onward towards the materialization of their ideals in the foundation of State veterinary institutions to stand as monuments to their renown for veterinary learning and in veterinary education. Therefore it was to our credit that, a few years ago, we made Dr. Leonard Pearson our chief executive officer; it was a graceful tribute to his zeal that we raised Dr. James Law to the presidency of this Association. Both are exemplars of State veterinary education and the immediate cause of the fortunate events of which I have just been speaking.

The foundation of State veterinary schools, in one form or another, comes as the fruition of many kinds of endeavour.

My study for the last eight months of the subject, "What the several States are doing for the Furtherance of Veterinary Intelligence and Education," has convinced me that through its encouragement, by the Morrill Land Grant Act, the Hatch Act and the Adams Act, of every kind of agricultural education and investigation, the National Government has, among other things, been in a large way cultivating and fostering veterinary intelligence in the States royally and with lavish hands. Through the Federal funds disbursed to each State by virtue of these Acts, the States have been enabled to provide teachers of veterinary science in State institutions, investigators of veterinary science in the experiment stations. Scholastic and popular State veterinary education has grown up. Through the *scholastic* veterinary work at the agricultural colleges thousands of students yearly have received a more comprehensive view of the field of veterinary science and its purposes. Through the *popular* State veterinary education, by the medium of popular veterinary publications and the lecture platform, the remotest parts of the States have been reached by veterinary intelligence. Thus it has come to pass that the Professor of Veterinary Science at the State institutions has become a person whose opinions have been weighty in veterinary legislation.

But the Federal veterinary agencies, so acceptable to the States, have not been the only causative factor in the upspring of professional veterinary courses in State institutions. The history of each State shows that where fakirs and quacks abounded graduate veterinarians soon appeared to displace them. As time progressed State veterinary associations were founded, shortly gained in numbers and power, which became virile and coercive in the State Legislature. Thus, by agencies at work along many avenues, State Legislatures have come to voice State needs in the foundation of professional veterinary courses in State institutions. However, when all these lines of force are about to have definite effect in legislation, one man usually stands out as leader, or immediate cause of legislative enactment: Law in New York, Pearson in Pennsylvania, Glover in Colorado, Schönleber in Kansas, Nelson in Washington.

In contrast to this, we have the proposed State veterinary school in Chicago, which, report says, is to come into existence under the auspices of the University of Illinois, the land and buildings for which are to come from the packing firms, the financial support from the State of Illinois. Here a State veterinary institution springs into being as the result of a national movement making for reform in the packing industry. The endeavour is to put to silence the European criticism of American veterinary inspection, which may have been sincere, by the foundation of a school to train veterinary inspectors for the public service, in the centre of the American trade, unhampered for money, under State control.

Whatever way the end, State veterinary education, is accomplished, matters not. Overtures have been made by at least three private veterinary schools to be taken over by the State, but in only one case were they successful. The reason for this is that the States usually prefer, for the sake of economy and expediency, to open departments

of veterinary science leading to a degree in State colleges or universities already founded. Hence the chances are, as illustrated in the case of Michigan, that it is easy to bring about the foundation of a veterinary department in a State agricultural college, which thereby becomes more useful to the animal industry of the State. Whether the course be established in a State agricultural college, or in a State university, in country or city, the same end, in the long run, is gained; for the veterinary course established will be considered equivalent to any other course of similar grade in the institution, and would be conducted with the same dignity. When State veterinary education once becomes established, the relation of the State to the veterinarians trained by it is altered. The bearer of a State diploma would likely be the recipient of professional favours and preferences. The State vouches for the diploma and the man.

However, additionally, it is the duty of each State to define the conditions under which men shall be allowed to enter veterinary work within the State, or remain in that work, and to defend their interests by legislative enactment. It is the sovereign right of the people of each State to declare, through its legislative representatives, who shall be the proper persons to practise veterinary medicine and under what terms. This cannot be determined, as in France or Great Britain, by national legislation. We have, here in America, no right granted in the Federal Constitution, permitting Congress to found veterinary schools, as has been done in France, expressly to fit veterinarians for general practice or whatever other veterinary work to which they may wish to turn their hand. However, though the question has never seriously arisen in the American daily Press, it would be permissible for Congress to found and endow national veterinary colleges for the purpose of supplying efficient men for the Departments of Agriculture or War, for the veterinary inspection service of the Department of Agriculture or the Army. There always will, therefore, be differences between the law granting right to practise veterinary medicine in one State and that in other. The dissimilarity is inevitable, because of different conditions in the animal industry of each State, and because of different evils to be met by the law. Nevertheless, the movement for State veterinary education will have a tendency to lessen the evils against which veterinary practice laws are usually directed; while, at the same time, it dissipates the present disparity between the States when a man, legally registered in one State, wishes to practise in another.

The two chief evils against which veterinary practice laws are directed are: first, quackery, the ignorant and barbarous practice of entirely incompetent men upon sick animals; second, lesser incompetency, the exclusion of men, much better prepared than quacks, but whose knowledge, judged by the veterinary standards of the State concerned, is not sufficient to warrant their being permitted to practise. The preparation of men, through veterinary education in State institutions, for work in the State, means that the State recognizes the ignorance prevailing, its duty to supply men for practice, and the necessity to safeguard its flocks and herds through veterinary enlightenment radiating from its own institutions. Where State professional veterinary education is not conducted we are apt to find an elysium for quacks and lesser incompetents. With the establishment of State veterinary

education and its growing strength, we are apt to find strong veterinary practice laws and war to the knife against quackery and lesser incompetency. This is the reason, for example, why Kansas with one hand gives $70,000 for a veterinary building at its State Agricultural College, and with the other a veterinary practice law to control the ignorant. This is also the reason why Michigan one day passes a veterinary practice law, the next makes way for a full veterinary course to be established at the State Agricultural College.

Far be it from me to declare that State veterinary education is a panacea for all evils found in veterinary practice in the several States. Yet it is tenable that when public opinion in its might is once aroused in a State at the danger of allowing ignorant men to pass judgment in case of animal plagues, or to tamper with animals in disease, reforms inevitably ensue. The only rational conclusion to be arrived at is that the State control practice, educate veterinarians for its public service, and make all amenable to the penalties for breach of the law.

Furthermore, anyone who has studied such a book as that by Francis M. Thorpe, formerly professor in the University of Pennsylvania, "The Constitutional History of the States," which is an authority on that subject, or has made a simple comparison of the Constitution of one of the American States with that of another, will know that there are great differences in the expression in State Constitutions of what are believed to be State rights. In the formation of law, therefore, relating to veterinary education and practice, the people of one State will, in the exercise of their sovereign power through legislation, express their desires very differently from those in another. This is the reason why there are many differences in the practice laws, why each State may choose the place where State veterinary training shall be conducted, whether at an agricultural college or other State institution, and why the courses offered would differ. For the same reason, just as the States, as a rule, do not allow a man with a medical diploma from a medical school outside the State, or a licence to practise in another State, except in certain exigencies, to practise in their own State until he has passed their own examination, so also it is not to be supposed that a veterinary medical diploma or licence acceptable to, or granted in, one State will be acceptable in another. The veterinary medical laws will always be stricter in some States than in others just as medical laws are stricter in one State than another.

Notwithstanding that, State veterinary education tends to the equalization of veterinary courses in one State and the other, and so to bring about that *entente cordiale*, that *concordat général*, which we all so strongly wish. The professors in the State institutions, who give all their their time to their students and are under obligation to the State to bring them up to its veterinary standards, will train the men according to the most recent methods in the veterinary art, and in the most recent veterinary knowledge. With the provision of adequate funds by the States, eventually the veterinary institutions of each State will differ but little the one from the other; nor will students of one State institution be much to be preferred over those graduated in another.

It matters little in Great Britain whether a man has taken his veterinary course in the Royal Veterinary College, Dublin, the Royal (Dick) Veterinary College, Edinburgh, the University of Liverpool,

or the Royal Veterinary College, London – the entrance requirements for each are the same, the courses substantially the same, the requirements for practice the same, and each man receives the appellation M.R.C.V.S. when he has passed the final examinations. It matters little in France whether a man has had his veterinary training at Alfort, Lyons, or Toulouse, for matriculation, curricula, and requirements for licence are uniform. It matters not in Germany whether a man has been trained in the Veterinary High School of Giessen, Hanover, Strassburg, or Berlin, as the requirements in each are similar. In each of these countries the secret of unformity is that it has been accomplished by national legislation; this is true, at least, in Great Britain and in France.

In America the Central Government has no authority to bring about such a uniformity, nor even similarity, in veterinary matriculation, curricula, degree, and requirements for practice. The American Veterinary Medical Association contains most of the master minds of the American branch of the profession. But the moral force which we can exert to foster our ideals in regard to raising the standard of veterinary education in America has the same weakness as that found by historians and students of statecraft in the Continental Congress at the time of the War for American Independence, 1776. We cannot coerce, we can only show the need for change, not impose our ideas, individually or collectively, on the States. We lack effective authority. However, we have moral force, and that is much. We should use it to originate legislation for the foundation of State professional veterinary education, being assured that the moral force thus spent will bear fruit a hundredfold as time goes on. The educational ideals of the American Veterinary Medical Association can be best expressed in the encouragement, through the agency of strong State veterinary medical associations, the puissance of the Press, the might of public speech when occasion offers, the subtle and engaging influence of conversation with men in authority, of the foundation of veterinary departments in State institutions, in which the matriculation requirements, curricula, requirements for graduation and right to practise, may be equivalent to those at the better State veterinary institutions already established. When once established, the force of popular opinion within the State in favour of State veterinary education, fostered by the State Veterinary Association, and the exhibition of mental and moral energies, grandly displayed, through the obligation of the veterinary teachers to the State they serve, will be sufficient stimuli to assure the production of veterinarians of the right stamp.

Reviews.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE. Vol. i., No. 6. April, 1908. Longmans, Green and Co., 39, Paternoster Row, London; New York, Calcutta, Bombay. (All rights reserved.) Price 7s. 6d. net., pp. 64 + xvi. Fully illustrated.

The Report of the Proceedings of the Royal Society of Medicine always makes interesting and instructive reading. The Sections of the Society are as follows: Clinical, Dermatological, Electro-Therapeutical, Epidemiological, Laryngological, Medical, Neurological, Obstetrical and Gynœcological, Odontological, Otological, Pathological, Surgical, Therapeutical, and Pharmacological. Many interesting subjects are presented in each Section, and especially interesting to the veterinary surgeon is a case reported by H. G. Adamson, M.D., of pustular ringworm of the horse (conglomerate folliculitis) in a child.

OUR SLAUGHTER-HOUSE SYSTEM: A PLEA FOR REFORM. By C. Cash, B.A. And THE GERMAN ABATTOIR. By Hugo Heiss. Pp. xii. + 212, 60 illustrations. George Bell and Sons, London.

Our slaughter-house system is only equalled in its mediæval primitiveness by the other black spot on the escutcheon of our much-vaunted twentieth-century civilization, namely, our dairy system.

This little book, as the author tells us, is not the product of a meat scare; its aim is to enlighten the "man in the street" on a subject about which he knows little, and possibly cares less, but which is nevertheless of supreme importance to the health of every consumer of meat. Mr. Cash sets himself the task of proving, by means of photographs and descriptions, the revolting conditions under which the larger quantity of meat is obtained in this country. To those who are acquainted with the private slaughter-house this volume is just an expression of their views, perhaps not so forcibly expressed as they would wish, but quite true. As an example of the conditions prevailing throughout the United Kingdom, with very few exceptions, we have the report of the Medical Officer of Health of Coventry, in which he certifies that out of the fifty slaughter-houses in this town only two are "sanitary," while forty are "very unsanitary."

In the larger cities, where some of the slaughtering is done in a public abattoir, the inspection of meat cannot be properly carried out owing to the number of inspectors being quite inadequate for the amount of work to be done. The question as to who is the correct person to inspect slaughter-houses and meat is easily answered. He must be a man who has had practical training in meat inspection, and the veterinary surgeon who has had this should certainly, one might expect, take precedence over the layman whose whole training has been crammed into a matter of two months. An extract is printed from a report of the Royal Commission, which states that among the men fulfilling the post of meat inspectors are plumbers, carpenters, a bricklayer, &c., &c. The report adds that many witnesses expressed the opinion that veterinary surgeons alone should be employed for this work. Let veterinary surgeons see to it that they are prepared to undertake these duties, for we are moving imperceptibly towards legis-

lative reform in this matter, when the properly qualified man will be in request; but until the power to deal with the problem is put into the hands of a central authority no progress will be made.

The comparison with the German methods is most unfavourable to us. In that enlightened country every city and town, even of only 1,500 inhabitants, has its properly-equipped abattoir, and the inspection is in the hands of qualified veterinary surgeons. It is worth while our observing the German methods in view of the change which, despite the antagonism of the more ignorant type of butcher, is bound to come in our methods of slaughtering animals.

Included in the volume is a chapter devoted to a side issue of the subject-matter, namely, the humane slaughtering of animals. The reader will concur with the author in condemning the cruel practice of bleeding sheep, pigs, and calves without first stunning them—a practice commonly employed not only in private slaughter-houses, but also in certain of the abattoirs. The Jewish method of slaughter is one which has provoked much discussion and objection from time to time, but as a religious ceremony it will probably survive the attacks of the critics, and will come to an end only with the race which practises it.

We strongly recommend this little book to the members of the profession. It gives a true picture of the present-day state of affairs; it provides information which is necessary to controvert the arguments of those who say that what has been good enough up to the present will do for the future, and it brings home to us the urgent necessity for legislative reform.

Translations.

CASE OF CATTLE POISONING BY LIMA BEANS (*PHASEOLUS LUNATUS*).

BY PROFESSOR MOSSELMAN, BRUSSELS.

Up to the present no cases of poisoning by this grain has been reported. The first recorded is this one about which the author was consulted.

Four oxen and two heifers were affected after eating about 400 grammes of the beans in their food. Very shortly after the meal all six became greatly excited, getting up and lying down constantly; they were all salivated, the flow of saliva being excessive. A veterinary surgeon was sent for, who arrived in about two hours, but in the meantime the owner became alarmed and had three of the oxen killed in order to save the meat. The remaining animals were greatly swollen, had slight diarrhœa, quick pulse and respirations, muscular spasms, and in one case there was paralysis of the hind quarters. These symptoms gradually disappeared, and in a short time all the animals were in their usual state of health.

Three samples of beans were sent to Professor Mosselman for examination. When planted they germinated and grew rapidly, but both chemical and experimental tests failed to detect either poisonous alkaloids, metallic, or volatile substances, also there were no moulds or fungi.

Two oxen were given beans in their food; they were attacked with vertigo, difficulty in standing, and inability to move. On examination the stomach appeared healthy, but hydrocyanic acid was obtained by distillation of the contents: subsequent experiments showed that this was formed in the stomach. He macerated 100 grammes of beans in water for twenty-four hours, at the temperature of the room, and obtained a characteristic reaction of hydrocyanic acid. Twenty-five grammes were macerated for an hour at a temperature of 40° C., and the filtered fluid, which gave a characteristic reaction, was injected into the peritoneum of a guinea-pig: the animal quickly died, with all the appearances of hydrocyanic acid poisoning.

Other parcels of the same cargo of beans had been purchased by various stock-owners, and in several cases there were also fatal results In two cases they had been cooked.

The active poison of the *P. lunatus* is a glucoside (phaseolunatin) which, on fermentation, forms hydrocyanic acid and acetone, but boiling water stops the process. The leaves also are poisonous, but the degree depends on their age, and when gathered.

(*Annales de Médecine Vétérinaire.*)

THERAPOGEN.

BY SCHADE.

THERAPOGEN is a combination of terebene, naphthaline, and saponified linseed oil. It is a limpid, clear, transparent fluid of a reddish-grey colour, with an agreeable aromatic smell; soluble in water, alcohol, ether, and glycerine; with chloroform it forms a gelatinous mass; it is easily made into a powder with borax, oxide of zinc, or starch.

According to Drs. Aufrecht, of Berlin, Trenzer, of Aix-le-Chapelle, and Troestar, a military veterinary surgeon, it has good bactericidal properties. The practical application in medicine has been studied by Dr. Flatten, of Cologne (*Berliner tierarztliche Wochenschrift*, 1904, No. 38), who recommends it in a 3 to 5 per cent. solution in suppurative diseases of the skin, in a 2 per cent. solution as a surgical antiseptic, and in a 20 per cent. solution in chronic skin diseases. It is not poisonous.

(*Zeitschrift fur Veterinärkunde.*)

PUNCTURED WOUNDS IN THE FOOT.

BY PROFESSOR PEUCHE, LYONS.

IT frequently happens that after a horse has apparently recovered from a punctured wound in the foot he may, up to about a fortnight after he has been put to work, again go lame. If the lameness is severe it is due, in the majority of cases, to necrosis of the plantar aponeurosis and this must be exposed and excised. The diseased tissue must be completely removed, and the operation wound must be made clear and sharp. The sole must be thinned down till it is a mere skin, the thickness of a sheet of paper, but this is a long, tedious and

painful operation, and in performing it the sensitive sole is very likely to be wounded. Furthermore, if the horn is not sufficiently thinned, the pressure it exerts on the inflamed tissue may give rise to disastrous results.

The author recommends drawing the sole. He admits that it is exceedingly painful, but this can be obviated by the use of an injection of cocaine over the fetlock, and the advantages are obvious, and all injurious pressure is removed.

(*Société des Sciences Vétérinaires de Lyon.*)

TWO CASES OF GASTRO-ENTERITIS IN THE HORSE.

BY M. E. PINCEMIN, ROUEN.

GASTRO-ENTERITIS, when it reaches a certain degree of severity, in some cases gives rise to depression and drowsiness in the horse, and is a most unfavourable symptom. The yellow tinge of the mucous membrane which is seen is an indication that the mucous membrane of the intestine and the liver are not acting properly, and that the organism is impregnated with toxic material that is produced in the bowel in abnormal quantities. The drowsy symptoms that are frequently seen at the very beginning of the attack are due to the action of these poisons on the nerve centres. Usually the nervous symptoms disappear with the intestinal troubles, but if the toxins are present in large quantities and are absorbed into the system they give rise to serious conditions, such as meningo-encephalitis, &c. M. Parent, of d'Autun, has recently described cases of epilepsy, which he attributes to intestinal derangement, and which disappeared with the primary cause.

In June, 1906, the author saw a case of a horse, aged 4, suffering from acute gastro-enteritis. with yellow membranes and deep coma from the commencement of the attack. This ran on into alarming meningo-encephalitis, but the animal eventually recovered. In a second case the patient died in a state of delirium.

Henri Bouley relates a case of an animal with acute hepatitis that developed vertigo alternating with delirium, which he attributed to the hepatic derangement.

One of the author's cases was an entire colt, aged 3. He was worked hard but well fed, nevertheless he was always in bad condition; this, however, was attributed to the fact that he was a free worker. He had had strangles, and had been treated for colic several times. On October 6 he had been working all the morning, and had been drenched by a very cold rain. On returning to his stable he refused his food, stood diagonally across the stall, with his head resting on the manger, and appeared to be asleep. The next morning he was in the same condition, walking with difficulty and dragging his limbs. When taken out of the stable he went down on his knees, fell over on his side, and got up with difficulty. The conjunctiva was of a yellow colour, the mouth dry, clammy and fœtid, pulse strong and somewhat quickened; respirations normal; temperature 39·1° C. The droppings were very dry, hard, and scanty. The horse drank, but refused all food. At about 11 a.m. on October 8 he wandered into the corner of his box, and

began to swing his head about from side to side. About three hours later he was bathed in perspiration, was unable to see, and the sense of feeling was greatly impaired. He continued pressing against the wall for some time, when he climbed up into the manger, and finally fell backwards on to the ground, where he lay for some time. There were five of these paroxysms in four hours.

During the periods of coma it was noticed that there was remarkable rigidity of the muscles of the neck, which it was impossible to bend. The head was extended, the point of the nose being turned to the left, and the lower jaw twisted to the same side. The teeth were ground together, and there was twitching of the muscles of the nostrils and lips. The urine was passed involuntarily. When on his feet the body was inclined to the right, and if excited this position was exaggerated. When the hand was placed on the forehead to give the animal a point of resistance to press against there was a tendency to raise the head, which were thrown upwards the moment the hand was removed, when there was great danger of falling over. It was also remarked that the horse, who was never very quiet, retained his vicious habits, kicking when touched on the hind quarters.

There were two other attacks on the nights of the 8th and 9th, during the second of which the horse fell over on his side. Early on the morning of the 9th there was some improvement; the patient was quieter, he appeared able to see and hear, and to a certain extent took notice of surrounding objects, but he still kept pressing forwards against the wall. The temperature was 38° C., and the mucous membranes a deep orange colour. There was great depression, and the horse from time to time stood with the toe of one forefoot on the ground, as if suddenly arrested in progressing. The stiffness of the neck had disappeared, and it could be easily moved. When the loins were pressed upon he gave way under the hand. The bowels failed to act, and enemata only brought away a small quantity of fæces and mucus, accompanied by violent straining. At about noon on the 10th he was attacked with violent spasms, and broke out into a perspiration, the abdomen was drawn up, the respirations became blowing, the mucous membrane black in colour, and he died from asphyxia at about 3 p.m. It was noticed that all the symptoms became worse in the morning, and that the vicious habits remained.

A *post-mortem* examination was made the next day. The mucous membrane of the stomach was of a dark violet colour, and covered with a clear yellow slime. The small intestines were covered with red patches the size of the hand, which showed through the walls before the bowel was opened. The liver was black and engorged with blood, although it was not enlarged or altered in structure, but on its posterior surface it was covered with membranes from 2 to 3 cm. in length, and the lobes were united together with organized bands. The brain was normal in colour and structure, if anything somewhat anæmic. The heart was covered with ecchymosed spots, more particularly in the furrows, and the tissue had a boiled appearance. The valves were black in colour. The right lung was congested, the left normal, and the bronchi congested and full of froth.

The poor condition of the horse, the repeated attacks of colic, and the retraction of the abdomen, all pointed to old-standing disease of the digestive organs; and no doubt there had been a former attack of con-

gestion of the liver, with exudation into Glisson's capsule, and when the final attack of enteritis came on the mucous membrane of the bowel and liver were not in a condition to offer any resistance.

Although the rise in temperature was slight, the attacks of coma and frenzy, with the tremors, were sure indications of meningitis, and showed that it was a secondary complication to enteritis, as it may be in pneumonia and typhoid fever.

(*Revue Générale de Médecine Vétérinaire.*)

PLASTIC OPERATIONS ON THE BACK.

BY CHANIER.

THE author gives the following directions: The skin is shaved, washed with ether, and an antiseptic compress put on, kept in position by a surcingle, the evening before. He has, however, frequently done all this just before the operation, washing aud scrubbing the part with a solution of corrosive sublimate. The instruments are all boiled and disinfected.

The operation is performed on the horse standing, cocaine in a 2 per cent. solution being injected around the part. If the skin is not much altered a single incision may be sufficient, but if it is greatly indurated—which it is in the majority of cases—two elliptical incisions, *en côte de melon*, will be required and the piece of skin dissected out. In many cases both methods can be used at the same time. The wound is well irrigated. When all bleeding has stopped the lips of the wound are brought together with sutures, and a dressing of powdered salol, camphorated naphthol, or picric acid and ether, applied, and over this a coating of flexible collodion is put on. The patient is tied up so that he cannot rub the part or disturb the dressing.

The author has performed nineteen operations, and in sixteen there was union by first intention, without any painful cicatrix being left. The average time the animals were out of work was about twenty days.

(*Recueil de Médecine Vétérinaire.*)

OUTBREAK OF GANGRENOUS MAMMITIS IN EWES.

BY DETROYE.

THE outbreak took place in a flock of forty-five Charmoise ewes, of which twenty-five were in milk; out of these four developed gangrenous mammitis in less than five days. The flock was carefully looked after, and kept in the very best sanitary condition. For a long time no new purchases had been made, and the disease was unknown in the locality. The lambing pen was abandoned aud disinfected, and the diseased animals segregated. Treatment consisted of subcutaneous injection of 40 cc. of carbolized water every other day, which caused the diseased tissue to be sloughed off. Two animals recovered. The author thinks this plan worthy of further trial.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

NOTE ON THE THERAPEUTIC VALUE OF TOBACCO.

BY PROFESSORS PEUCH AND PORCHER (LYONS).

THE authors publish their observations on the use of tobacco in the treatment of parasitic skin diseases in animals. The pure tobacco juice should be diluted with twenty times its volume of water, and it is recommended to add 100 grammes of commercial carbonate of soda per litre of the solution. Except for sheep, it is dangerous to employ it as a bath or dip, and it should not be used at all if the skin is much abraided or if there are wounds.

(*Société des Sciences Vétérinaires de Lyon.*)

CASE OF TORSION OF THE UTERUS IN A COW SIX MONTHS GONE IN CALF.

BY DESLEX.

THE author was called to an eight-year-old cow, six months gone in calf, that was supposed to be suffering from "a sprain of the loins." As she did not improve, in fact got worse, she was examined to see if the calf was still alive. The vagina was twisted from right to left, and at the mouth of the uterus was turned to the left; the finger could only be introduced by a rotary motion.

As the cow was in good condition, slaughter was advised. From the abdomen from 10 to 15 litres of blood-stained serum escaped, the peritoneum was covered with dark patches, and the uterus resembled a black tumour measuring 80 by 60 cm. The vagina resembled a cord with three spiral twists in it. The walls of the uterus were thickened, and the fœtus was well formed.

The cow was in the habit of mounting her companions, and on three different occasions was seen to fall over on her hind quarters. The author attributes the accident to this habit.

(*Schweizer Archiv. für Tierheilkunde.*)

PAINLESS CASTRATION.

BY BOISSE.

WITH a view of alleviating pain in the operation of castration, the author uses hydrochloride of cocaine as a local anæsthetic.

In the horse, the animal is thrown and secured in the usual manner. If M. Jacoblet's operation is performed the cocaine is injected on the line of the middle raphé at the point where there is to be only one incision in the skin. If clamps are used the injection is made over each opening. The operator grasps the skin of the scrotum between the thumb and index finger of the left hand, pressing in the needle of the syringe and at the same time giving the injection. To anæsthetize the cord, it is taken in the left hand from before backwards with the thumb below it, commencing on the left side. The needle is then plunged into the cord from before backwards a hand's breadth below the epididymus. The cocaine is injected before the parts are rendered aseptic after washing them with soap.

In the bull the operation is performed standing, the hind legs being secured. The injection is made in the same way as for the horse.

In the ram, only anæsthesia of the cords is necessary if bistourage is to be practised; but if the testicle is to be removed, then the same procedure as in the horse is required.

With the dog, the animal is fastened firmly on a table and securely muzzled, three injections being given.

The doses are :—

	Horse.	Bull.	Ram.	Dog.
Cocaine ...	0·20 gramme	0·20 gramme	0·20 gramme	0·05 gramme.
Distilled water	5· grammes	5· grammes	5· grammes	2·5 grammes.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

INTESTINAL CONSTRICTION.

BY M. G. DAMÉDOURT, CAUMONT-L'EVENE (CALVADOS).

THE case is one that the author saw in a Norman cow about 9 years old, that was six months gone in calf. The sire was a bull that had been in contact with a herd of cows amongst which an epizootic of abortion had broken out.

For about eight days the appetite had failed, and the udder shrank up, but the general condition was fairly good. The cow did not groan, and there had been no signs of colic. The respirations were normal, and the temperature 39° C. The next day (November 25) the general condition was the same. The vulva was slightly covered with pus, and the owner said he had noticed one or two slight attacks of colic. The author was suspicious that abortion was about to take place, so he prescribed anodynes.

On the following day the fæces were fluid, of a yellowish-white colour, and very offensive. Tannin and opium were given, but without any effect.

December 3.—There was grinding of the teeth, but no signs of abortion; the bedding, however, was soiled with liquid fæces. The abdomen, however, remained full, but there was a twitching under the fascia lata on the right side. This had been in existence since the beginning of the attack, but was now much more clearly marked.

December 8.—A six-months fœtus was slipped; the membranes were much decomposed, but were retained in the uterus. The mother then recovered somewhat, and the appetite gradually returned. She drank gruel and hay tea, and was drenched with cider, but refused all solid food.

The diarrhœa, however, remained, and the appetite again became very bad, and on the evening of December 12 the cow went down, began to groan, and the respirations became accelerated, in fact, she seemed to be at death's door. The next day, however, the diarrhœa became more severe than ever, with great enlargement of the abdomen. A new symptom was the appearance of a hard, movable, painless tumour, the size of a man's head, in the hollow of the flank. The cow died on December 17, but it was noticed that throughout her illness her skin remained in good condition, although she ate so little.

Post-mortem Appearances.—There was a considerable amount of fat about the muscles, and about 3 litres of a turbid yellow-coloured fluid in the abdomen. The uterus was contracted, and contained a small quantity of greyish-coloured fluid. The right kidney did not adhere to the capsule, on which were a number of yellow-coloured granulations of a cheesy consistence. One lymphatic gland was the size of a pigeon's egg, and on section showed several carious patches. The most important lesion that was present was a growth the size of a man's head, that surrounded the small intestine and part of the colon in the region of the ileo-cæcal valve.

Both the large intestine and cæcum were filled with a greenish-coloured fluid, with particles of food floating about in it. In the colon there was a small quantity of fluid resembling chyme. In all these structures there were all the appearances of acute inflammation.

The growth was formed out of lardaceous tissue, that contained caseous patches, but it was not adherent to the walls of the intestine, which it did not implicate, although it surrounded them. The terminal portion of the ileum was greatly contracted, and with difficulty admitted the little finger.

No doubt the disease was old standing, and a correct diagnosis was impossible in the living animal. A guinea-pig was inoculated with a portion of the growth beaten up in water, but with negative results. It is worthy of remark that tuberculosis is uncommon in the Department of Calvados.

(*Revue Générale de Médecine Vétérinaire.*)

Books and Periodicals, &c., Received.

Journal of the Royal Army Medical Corps; Board of Agriculture and Fisheries; Department of Agriculture and Technical Instruction for Ireland; Kansas State Agricultural College; Toronto World.

Letters and Communications, &c.

W. H. Dalrymple; R. F. Stirling.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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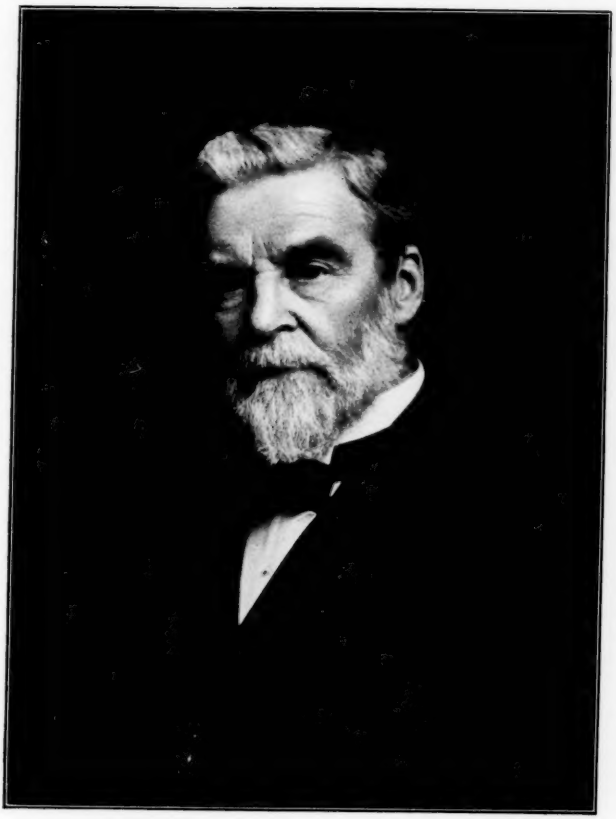

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